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*At a meeting of the Council of
the R. Society.*

Ordered,

T*hat a Discourse presented to
the R. Society, Entituled,
Elements of Speech ; or, An Essay
of Inquiry into the Natural Pro-
duction of Letters, with an Ap-
pendix concerning Persons Deaf
and Dumb , be Printed by John
Martyn, Printer to the said Society.*

BROUNCKER Pref.

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ELEMENTS
OF
SPEECH:
AN
ESSAY of INQUIRY
INTO
The Natural Production
OF
LETTERS:
WITH
An *APPENDIX*
Concerning Persons
Deaf & Dumb

BY
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THE P R E F A C E.

IT hath been to me a matter of Wonder, that in the Alphabets of all Languages whereof I have any knowledge; there is not to be found either Order or Perfection. The Characters (or written Letters) neither being adjusted to the sounds of Letters pronounced; nor disposed in the Alphabet according to any rational or Natural Order. The Consequences whereof have been, to render Languages more difficult to be learnt, and needlessly to advance Orthography into a troublesome and laborious Art; and to hide the Nature of Letters in obscurity, so as not to be found without much searching; nor perhaps to be sufficiently searched, by such as are moved to it onely by Philosophical Curiosity, and are not by

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The Preface.

any necessity engaged to a pertinacious diligence. Though in this kind it must be acknowledged, that some excellent Persons amongst us, who are above my Approbation or Elogy, have considered this Subject with great Care and Felicity. And it having happened to me some years past, to have been deeply engaged in this same consideration of the Alphabet, by a Worthy Designe of giving Relief to a Deaf and Dumb Person, in the year 1659. recommended to my Care: and being at last prevailed with by divers Persons, who remember the success of that Enterprize, to Communicate the way and method I then used; I have adventured to publish my thoughts concerning the Nature of Letters; more in respect of the Appendix, or Application of them to that excellent purpose, than that I esteem them worthy to trouble the World, or able to produce any considerable addition to the discourses of this Subject already extant: onely in regard of the obscurity and subtilty of the difference of Letters, by reason of which, several Persons are apt to make different guesses

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guesses and observations, and to be often unfixed, and change their thoughts upon better Consideration, as I have experienced, and believe the same must have happened to others; it were to be wished, that all who have considered this Subject would Communicate their thoughts and ways of finding out those differences, which being done, every Hypothesis would contribute some Light, as I hope this of mine may do; wherein I have endeavoured to abstract my self from prepossession of Fancy, either by the Idea's of faulty Alphabets, or the Notions of other Authors. And here I must intreat the Reader to do the like for me; and withal, to read the Treatise of Letters once over, without staying to dispute or examine particulars, which he will often find more plainly expressed afterwards; and then, if he shall think it worth his trouble, to go over it again, and at his pleasure, stay to make trials and examinations.

The Obscurity of the Subject, and the Prejudice and Prepossession of most Readers,

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ers, may plead excuse for any Ampliations or Repetitions that may be found, whilst I labour to express my self so plain and full, that the Nature of Speech and Letters, so far as these present thoughts of mine reach to it, may be understood by all.

ERRATA.

PAge 3, line 10. tion. l. 12. either, both to. p. 10. l. 22. designed to be. p. 11. l. 9. have their. p. 12. l. 18. betw of. p. 17. l. 7. the most apt. p. 19. l. 11. and. p. 29. l. 1 which is. l. 4. of one Organ. p. 30. l. 1. of Motion. p. 34. l. 9 *Spiritual, Ore-Vocal*. p. 41. l. 10, ed *Original Letters*. p. 42. l. 9. then the same. p. 49. l. 13. and *Myleogloß*. p. 53. l. 12. *Ng Naso-Voca'*. [Obs. there was intended a Character for Ng, viz. n with a tail like that of g. which must be understood where the Printer has imitated it by n or y.] p. 63. l. 20. Characters. p. 73. l. 7. Larynx, cannot. p. 74. l. 15. improperly. p. 81. l. 5. [Obs. the short Vowels should have been ranked thus: Folly under a, Fat under a, S:ll under e, Ill under i, Full under oo, the other spaces left blank] p. 81. l. penult. *Whispering*, be. p. 93. l. 8. their subile and. p. 97. l. 12. 36 Vowels. p. 101. l. 19. Letter. the. p. 104. l. 7. of the same. p. 107. l. 16. as they speak. p. 110. l. 7. to that. p. 123. l. 21. nearer. p. 129. l. 7. these Persons. p. 130. l. 17. respectively Letter spoken or written; p. 135. l. 19. out by being. p. 136. l. 1. Lips. Make him. p. 144. l. 7. shew him a. p. 152. l. 21. *Portraitsures*. p. 154. l. 15. a. p. 157. l. 19. (not to be thought on otherwise.)

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ELEMENTS OF SPEECH:

*An Essay of Enquiry into the
Natural Production of
Letters.*



OF the Five Senses, *Two* are usually, and most properly called the Senses of *Learning*, as being most capable of receiving communication of Thoughts and Notions by selected Signes; And these are *Hearing and Seeing.*

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The

The Object of Hearing is Sound, whose variety is so great, and conveyance so easie, that it brings in admirable store of intelligence and information to the common sense. And like to it in the same respects is the Object of Seeing.

Either of these learned Senses have their peculiar Priviledges: whereas Seeing requires Light, and a free Medium, and a right Line to the objects; we can hear in the dark, Immured, and by curve Lines, that is, Sound can pass to the Ears, where visual Rayes cannot to the Eye. But then, Sight takes in at a greater distance, and more variety at once, comprehending also Quiescent objects, which Hearing does not: and especially injoying the delightful variety of formes, and figures

figures, which come not to the Hearing. As to the present purpose, both these Senses embrace their Objects at greater distance, with more variety, and with a more curious discrimination, than the other Senses; so that they are most fitted to receive and distinguish *Signes* for Communication, and by their proper advantages mutually supplying the defects of either. And both together serve completely for the Reception and Communication of Learned Knowledge.

Now *Signes* for Communication may be contrived at pleasure from any variety of Objects (especially of one kind) appertaining to either Sense. For example, Four *Bells* admit Twenty four changes in Ringing, and

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Five

Five *Bells* One hundred and twenty : each change may, by agreement and consent, have a certain signification imposed upon it, and so Communication may be performed at a distance by Hearing. And for the Sight, Four or Five *Torches* held up at a Distance in the Night, 1 or 2, or 3, or 4, and any, or more of them elevated, or depressed out of their Order, either in Breadth, or Longways, may by agreement give great variety of Notifications. And thus, Thousands of Signes may be invented and agreed upon, and learnt, and practised. Thus the Drum and Trumpet by their several Sounds, serve for many kinds of Advertisements in Military affairs: and Bells serve to proclaim a scare-fire, and (in some

some places) Water-Breaches ; The departure of a Man, Woman, or Child ; time of Divine Service ; The hour of the day ; day of the Moneth, &c. Common life is full of this kind of significant Expressions, by Knocking, Beckoning, Frowning, Pointing and the like ; and Dumb persons are sagacious in the use of them. And even *Brute Animals* make use of this artificial way of making divers motions to have several significations, to Call, Warne, Chide, Cherish, Threaten, &c. especially within their own kinds. But of all other, there is none for this use comparable to the variety of instructive Expressions by *Speech*, wherewith *Man* alone is endowed, as with an Instrument suitable to

the Excellency of his Soul, for the most easie, speedy, certain, full communication of the Infinite variety of his Thoughts, by the ready Commerce between the Tongue and the Ear. And if some Animals, as *Parrots, Magpies, &c.* may seem to be capable of the same discriminations, yet we see, that their souls are too narrow to use so great an Engine. The chief, I say, of all signes, and which the *Almighty's* Providence, in the Creation of Man, indued him withall, and destin'd to that use, is *Humane voice* and the several modifications thereof by the Organs of Speech, *viz.* the *Letters* of the *Alphabet*, formed by the several Motions of the Mouth; and the great variety of Syllables compos'd of Letters, and form'd with

with almost equal velocity ; and the endless number of words capable of being framed out of the Alphabet, either of more syllables, or of one; or sometimes of a single Letter, according as, by consent and institution, they are ordered to signify the several parts of Speech or Language. And (which answers to the same end) the *Characters* or *Symbols* of these Letters expressed by Writing, or Printing, or Graving, &c. so as to remain visible, and discernable by the Eye ; viz. to each Letter a proper Character designed to signify the Power or Sound of the Letter, that when I see Letters joyned, I understand the sound, and am ready to pronounce it. And this is *Language in Counterfeit*. Whereas

Language, originally and properly (as the Word imports) is that of the Tongue, directed to the Ear by Speaking. *Written Language* is tralatitiously so called, because it is made to represent to the Eye the same Letters and Words, which are pronounced.

And by these the *Tongue* and *Pen* doe mutually correspond, and assist one another, Writing what we speak, and Speaking what we write. And (as was said of the Senses, to which they serve) they supply the defects of each other by the peculiar priviledges of either. Swift, and ready, and familiar Communication is made by Speech, and when animated by Elocution, it acquires a greater life, and energie, ravishing and cap-

o captivating the Hearers. But then,
i Speech is confined to the Living,
to and imparted to onely those, that
a are in presence, and is transient
d and gone. *Written Language*, as
e it is more Operous, so it is more
digested, and is permanent, and
it reacheth the absent, and poster-
ity, and by it we speak after we
are dead.

Now, as I said, the Original of
these Signes for Communication
is found in *Viva voce*, in *spoken*
Language, and therefore tis *Speech*
we now chiefly consider, I mean
the Principles thereof, which are
Letters. Now these Letters con-
sidered, as to their *Genesis*, i. e. as
they are made and fram'd by sever-
al *Motions* of the parts of the
Mouth, are the natural Elements of
Speech, but the use of them is *Ar-*
tificial,

tificial, viz. when they are composed, and designed by several Signs of Respective Notions: And hence Languages arise, when by institution and agreement, such a composure of Letters, *i. e.* such a Word is intended to signifie such a certain thing. And the Learning of a Language is (or at least needs be) nothing else, but the informing our selves, and remembring what Composures of Letters are, by consent and Institution, to signifie such certain Notions of things, with their Modalities and Accidents: I say, the *Motions* of the *Mouth* (speaking largely) by which the voice is discriminated, and the Sound thereof in distinct formes received by the Ear, according to the number of their variety, are the *Natural Elements* of

of *Speech*; and the Application of them in their several compositions, or Words made of them, to signifie things or the Modalities of things, and so serve for communication of Notions, is *Artificial*.

And the former of these, the *Letters*, as they have the natural Production by the several checks or stops, or (as they are usually called) *Articulations* of the Breath or Voice in their passage from the *Larynx* through the Mouth or Nose, made by the instruments of Speech, are the subject of this present *Essay*. Worthy indeed of better consideration, as being the *first Elements of all Humane Learning*, (to say nothing of the Propagation and Conservation thereof;) and by which having once surveyed

surveyed the true and proper natural *Alphabet*, we may easily discover the Deviations from it in the Characters thereof, in all the Alphabets in use : Either by Defect of single Characters of Letters ; or by Confusion of them ; or by expressing the Power of single Letters by unapt Compositions ; or by an absurd reception of double Letters, into the number of the Elements, which ought to be onely single and original ; or lastly by the incongruous pronunciations of several Letters, as they lie described to the Eye by Symbols or Characters of the Alphabet of several Languages, which indeed ought to be only one, or at least all to be perfectly correspondent each to other, according to their Origine in nature, though

though expressed by several Characters, after the humour and fancy of several Nations. Though it were much to be wished, that, as there is but one single way (whereof we are now treating) of the natural production of Letters, whereby to convey our thoughts by the sound of Speech to the Ears of them that hear us; so there were throughout the world but one sort of Character for each Letter, to express it to the Eye, and that exactly proportioned to the Natural Alphabet formed in the Mouth. This, though diversity of Languages continue, yet would render them much more easie to be learned, as to reading and pronouncing of them, and especially as to the Writing of them, which now, as they stand, we find to be trouble-

troublesome and difficult, and it is no small part of *Grammar*, which treats of *Orthography* and *right pronunciation*.

And truly the Disorder, into which the *Alphabet* is put, by the several ways fore-mentioned, seems to me of the same kind, though not so great, as if several Nations, using the same Characters, should apply them differently, and that Sound, which one describes by B, another should do the same by C. &c. which by private consent hath been sometimes used in dangerous times, onely to obscure their writing, and make it hard to be read by others not acquainted with the intrigue, but is quite contrary to any intention of advancing the facility of Learning.

But

But the chief design here intended by this accompt of the *Natural Alphabet*, is, to prepare a more easie and expedite way to instruct such as are *Deaf* and *Dumb*, and Dumb onely by consequence of their want of Hearing, (by shewing them the proper figures of the motions of the Organs, whereby Letters are framed) to be able to pronounce all Letters, and Syllables, and Words, and in a good measure to discern them by the Eye, when pronounced by another.

And although this cannot be directly and immediately taught, and learnt, as to every particular Letter of the Alphabet (as will be sufficiently manifest in the ensuing discourse) yet He, who has this exact knowledge of the
Nature

Nature and Difference of Letters, by knowing withal, what can be readily done, and what cannot be immediately performed; will be able to pursue such an attempt with steadiness; and having made his first progress in what is obvious and feasible; will then (without expence of fruitless labour) proceed to seek out and invent other ways to compass about and accomplish his designed effect.

And by these wayes (as I myself have made some experiment) it is not impossible, no nor very difficult to be done, even in those who were born Deaf and Dumb.

By what has bin premised, we may define *Language* (if we consider it more materially) to be
An apt Connexion of Letters,
forming

forming and producing Words and Sentences. But if we consider it more according to the Reason and Design thereof, then Language is the most excellent Instrument for Communication. Or, a connexion of the apt signes for Communication of our Thoughts and Notions. And Speaking is nothing else, than A sensible Expression and Communication of the Notions of the Mind by several Discriminations of utterance of voice, used as Signes i. e. having, by Consent, several determinate significancies.

The Matter or Store, out of which these signes are framed, is the Alphabet, that is, the variety of single different Letters, which Letters arise from the first original discriminations of voice, by

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way

way of Articulation, whereby the Ear is able to judge and observe the differences of vocal Sounds. And as many such different sounds as can be made by single Articulations, so many Letters there are in the store-house of Nature, out of which to frame Signes for Communication by way of Speech or Language.

I said, *Articulation*, because there may be other ways of discriminating the voice, E. G. by *Acuteness* and *Gravity*, the several degrees of rising and falling from one Tone or Note to another; and the several Kinds of Measures, Passions, Moods, Ayre, &c. out of which it were easie to frame a kind of Language, without Words, though not so Expedite nor Comprehensive as the other.

Now

Now to describe accurately the differences, by which the *Formal Reason* of every letter is constituted, however it seem at the first apprehension familiar and easie, and no one but can say something towards it; yet upon better consideration will be found very difficult: Because the Motions and Figures *within* the mouth are abstruse, and not easie to be distinguished, especially those of the Tongue, and several parts of it, which is moved, through the help of many Muscles, so easily, and Habitually, and variously, that we are scarce able to give a judgement and description of divers Motions and Figures thereby framed in the Mouth: And also because most are apt to seek all the Differences of Let-

ters in those Articulating Motions, whereas several Combinations of Letters are framed by the very same Motions of those Organs, which are commonly observed, and are differenced (as shall be shewn) by other concurrent causes. And lastly, by reason of the Prepossession of the Judgement of most men from their Infant-breeding, of which I have met with much Experience; and it may be seen in the writings of some Learned men, who coming to treat of the Nature of Letters, speak of them by Tradition, as of some remote exotick thing, whereof we had no knowledge, but by uncertain fabulous relations. And although I have bin told of some more accurate Authors, who take not
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the vulgar Alphabets and Rudiments of Grammar for their Canon ; yet I have refrained to look into them, for fear of being led away by other men's fancies ; whereas I rather chose to consult Nature at Hand. And herein I cannot hope to have escaped all prejudices of fancy, but do willingly submit those mistakes, into which I may have fallen, to the better consideration of others, who shall have made research into this business with more felicity. And certainly the free thoughts of many separate persons using diligence herein, compared together, select choice being made of the most happy adventures in each of their several *Hypotheses*, is the surest way to advance this kind of Essay to a

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good

good perfection. To which, if any thing be contributed by this that I have done, I shall not wholly have missed my end.

Of *Letters* the *Material* part is *Breath* and *Voice*; the *Formal* part is constituted by the *Motions* and *Figures* of the *Organs* of *Speech*, affecting the *Breath* or *Voice* with a peculiar sound, by which each *Letter* is discriminated. For either of these there are proper *Organs*. For the Former, the *Lungs*, *Aspera Arteria*, *Larynx*, *Uvula*, *Nose*, and the whole *Arch* of the *Palate* or *Roof* of the *Mouth*. The *Lungs* are as *Bellows*, which supply a force of *Breath*: the *Aspera Arteria* is as the nose of *Bellows*, or as a channel in the sound Board of an *Organ*, to collect and convey the *Breath*,

Breath, and somewhat more, by a power of contracting and dilating it self, which those have not.

The *Larynx* both gives *passage* to the Breath, and also, as often as we please, by the force of Muscles, to bear the sides of the *Larynx* stiffe and near together, as the Breath passeth through the *Rimula*, makes a vibration of those Cartilaginous Bodies which forms that Breath, into a Vocal sound or Voice, which by the *Palate*, as a *Chelis* or shell of a Lute, is sweetened and augmented. The *Uvula*, as a Valve, opens and shuts the passage of Breath or Voice through the Nose. The *Nose*, sometimes giving passage to Breath or Voice, in speaking alters their sound,

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and

and gives a Material discrimination, by which the general sound of Breath or Voice may be distinguished into *Oral*, or *Nasall*, or, (to speak more accurately) *Ore-Nasal*. And thus also the *Whole mouth*, as it gives passage to Breath and Voyce, and a distinct sound, from that of the Nose, ought to be accompted one of the Organs of the Material part of Letters.

By the way observe, that Letters may be framed by Articulation of onely Breath, for secret communication near at hand, as in *whispering*. But the most useful way of easie and free communication, being by the Voyce, and the Motions being the same in *whispering* and in *speaking*, it is intended here, to consider *vocal*
Speech

Speech alone, as that to which this Discourse refers. Though it be true (and ought to be well heeded) that divers letters have no Vocal sound , if pronounced alone, but do immediately affect the vocal sound of other Letters, to which they are joyned in Spech, by affecting first the Breath in their own proper Motions and Figures, such are F. S, and some others. The Organs of the Later, the *Formal part* of Letters, are the *Tongue, Palate, Goums, Jaw, Teeth, Lips*. Of which the *Tongue* and *under-Lip*, and *nether-jaw* are *moveable*. The rest are *immoveable*, viz. as to their use in speech. Articulations are made by the Motions of the *moveable* Organs to, or towards the *Immoveable*. As , the *Tongue*, (which is the chief

chief instrument of Speech) is every way moved in its parts to and from all parts of the Palate, and Goums, and upper Teeth, except the very cavity or Arch of the Palate, which is always kept open to help the sound. The under lip is moved to the upper lip, or upper Teeth. And these motions are attended by the motions of the nether-jaw.

Of Letters	{	The Material Cause is { Oral. Breath and { Nasal. Voice whole Organs are the	{	Lungs. Aspera Arteria. Larynx. Palat's Arch, or Roofe. Uvula. Nose. Whole mouth.
		The Formal Cause is Articulation of Breath and Voice whole Organs are		Moveable. Immoveable.
			{	Tongue. Under Lip. Nether Jaw.
			{	Palat. Goums. Upper-Lip. Upper Teeth,

In the framing of every Letter,
there is an Articulation (though
not

not to every Letter a *several* Articulation ; for sometimes two or three have the same, and are differenced onely by their material causes.) By *Articulation* I mean a peculiar Motion and Figure of some parts belonging to the Mouth between the Throat and Lips, whereof some are more easie to be discerned and described ; as those made with the Lips, P. B. M : with the Lip and Teeth, F. V : with the Tongue and Teeth, *th. db.* and those with the Tongue and Gutturals, and Tongue and Palate, which are close stopped, as T. D. N ; K. G. NG. The rest are more difficult, and most of all the Vowels, where there are peculiar Figures of the Cavity of the Mouth, between the Tongue and the Arch of the Palate,

Palate, whilst the Tongue moves into a Posture required to each Vowel, which is made without the Lips.

That I may be the easier understood, I do comply with the Antients, in distinguishing Letters into *Vowels* and *Consonants*; yet not wholly upon their reason, *viz.* That a *Vowel* may be sounded alone, a *Consonant* not without a *Vowel*; which if examined will not be found all true, for many of the *Consonants* may be sounded alone, and some joyned together, without a *Vowel*, as *Bl*, *St*; and as we pronounce the later Syllable of *People*, *Rifle*, &c. though it be true of some *Consonants*, as the Mutes, *P. T. K.* that they can make no sound alone: But from another difference,

ence, which is, That in all *Vowels* the passage of the mouth is open and free, without any appulse of an Organ of Speech to another: But in all *Consonants*, there is an Appulse of the Organs, sometimes (if you abstract the Consonants from the Vowels) wholly precluding all sound; and in all of them, more or less, checking and abating it.

Now from hence ariseth the facility of joyning a Consonant to a Vowel, because from an Appulse to no Appulse (or an Aperture) is easier, (because the Motion is not half so much,) than from one Appulse to another. And we find in the Motions from one Appulse to another, in joyning of Consonants, some (according to their easier aptness
of

of Notion, or nearness of Nature or situation) to be readier and easier joyned in one syllable, than others: Which made that observation of the *Grammarians*, of the easie pronunciation of a Mute before a Liquid, which do not therefore necessarily make the Preceding *Vowel*, by position, long in Quantity, as *Patrem*.

The Distinction of *Articulation of Breath* and the *Articulation of Voice* must be well heeded, because in it consists the onely difference of many Letters, as shall be shewn. For it is one thing, to *Breath*, or give an Impulse to breath alone; another thing, to *vocalize* that breath, *i. e.* in its passage through the *Larynx* to give it the sound of Humane Voyce. As through a Horne or
Cornet

Cornet, or Trumpet, you may, if you please, emit onely Breath without any other sound than of wind; or you may with the same Breath, regularly blown, raise the proper voice or sound of those Instruments. *Breath* then must be understood distinctly from *Breath vocalized*, or Humane voice, and either of them in their distinct Beings and Sounds may be, and are Articulated by the Motions of the Organs.

Now, though several single Letters nakedly considered, are found to be Articulations onely of Spirit or Breath, and not of *Breath vocalized* (as appears if you pronounce S. F. &c. abstracted from all vowels) yet there is that property in all Letters, of Aptness to be conjoyned in *Syllables*

lables and *Words*, through the voluble motions of the Organs from one stop or figure to another, that they modify and discriminate the Voice without appearing to discontinue it. And so Letters may well enough be termed *Articulations of Voice* in respect of Speech, which yet in their own simple abstracted Nature are but *Articulations of Breath*.

To come now nearer to our Inquiry into the *Production of Letters*, we are first to investigate the *variety of Motions*, and *Figures*, made by the Organs, which serve for Articulation. And then the *Variety of Matter*, to which those Articulations are severally applyed. For it will be found, that the same Articulation makes Impressions
of

of different sounds, or (which is the same) Letters, according as the subject matter, which is to be Articulated, is different : as one and the same Seal, imprinted upon several pieces of wax of different colours, as Yellow, Red, Green, Black, will make so many distinct signs (if significations be imposed upon them) to the Eye, as there are different Colours in the Matter, or Wax, which receive the same Impression. Thus the same Articulation ; if of *Breath*, makes one letter ; if of *Breath vocalized*, or voice, another ; If of *voice Nasall* (*i. e.* when the *Uvula* is opened, and the voice passeth into the Mouth, and is there Articulated, and at the same time hath a free passage through the Nose) then it

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makes another ; and lastly , if of *Breath Nasal*, then another. Thus the *Matter* of Sound, which is to be discriminated by Articulation, if it be of four kinds, *Spiritual, Vocal, Naso-spiritual, Naso-vocal*, (it is for shortness-sake, that I do not stile them more accurately, *viz. Ore-Spiritual, Ore-Nasal, Ore-Naso-Spiritual, Ore-Naso-Vocal*;) then every Articulation may produce four Letters. But the design of Speaking, being to Communicate our Thoughts , by ready , easie, and graceful Pronunci-ation, all kind of Letters have been searched out, that were serviceable for the purpose, as Commodious Elements of Speech, and such discriminations as were not so, whereof many may be found, (all Articulations not suiting with all matter) they were left out and laid aside. All

All Articulation is made *with-*
in the mouth, from the Throat to
the Lips inclusively, and is dif-
ferenced partly by the Organs
and several parts of Organs (al-
ready described) used in it; and
partly by the manner and de-
gree of Articulating: which later
is, either by *Appulse*, *i. e.* when
one of the moveable Organs
toucheth, and rests upon some of
those, that are Immoveable; Or
else onely by inclination of the
moveable Organ to the immovea-
ble, *without Appulse*, the passage
through the mouth remaining free
and open. If there be no Appulse
of one Organ to another, the
Letters by other several postures
and inclinations of the Organs
are *vowels*. But when there is an
Appulse of one Organ to ano-

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ther

ther, the Letters, which are so framed, are *Consonants*. Again, the Appulse is either *plenary* and *occluse*, so as wholly to preclude all passage of Breath or Voice through the mouth; or else *partial* and *pervious*, so as to give them some passage out of the mouth: and this later affects the Sound divers ways, giving it a *Lisping*, or *Hissing*, or else emitting it smooth, or else jarring.

The nature of *Consonants* being framed by Appulse, is (as was said before) much easier to be discerned, than that of the *Vowels*. I shall therefore endeavour, first to describe their differences, and how they are framed; taking the number of *Consonants*, not from the *Grammatical Alphabets* of any Language, but from the *diversity* of

of *Sounds* framed by single Articulations with Appulse, which I find in any usage; especially in our, and neighbouring Nations, such as are most needful for any among us, that are Deaf and Dumb, to learn. And thus they ordinarily amount to 19. besides 2 or 3 more (to be spoken of in their place) which will be found among the Vowels: omitting some other uneasy Letters, which I shall after describe, and possibly may be in use with some Nations.

If a close Appulse be made by the Lips, *viz.* by the Under-Lip, to the Upper-Lip, then is framed P, or B, or M; if it be made by the end of the Tongue to the Goums, T. or D. or N. If by the Bosse of the Tongue to the
C 3 Palate,

Palate, near the Throat, then K. or G. or N^g. so there are 9 Consonants made by *close Appulse*, and they evidently answer one another in their Properties; whether you compare them in *respect of the Organs*, the 3 Labial B. P. M. are Parallel to the 3 *Gingival* T. D. N, and to the 3 *Palatick* K. G. N^g; or whether in *respect of Sound*; P. T. K. are Articulations of Breath; B. D. G. (if you compare B to P; D to T; and G to K;) are made with the very same Appulse and Motion of the Organ; and are differenced onely by being Articulations of Voice, or Breath vocalized; which is easily discerned, if you strive to pronounce P. abstracted without a Vowel, then it will be wholly *Mute*, because it is no-
 thing

thing but Breath stopt: but if you in the same manner go to pronounce B, there will be a *murmuring* sound of the Voice, formed in the *Larynx*, and passing till it be stopt by the Appulse of the Lips. And so of the rest.

M. is an Articulation of voice, by close Appulse of the Lips; so far perfectly the same with B: but there is this difference added, that at the same time, passage is opened for the Voice through the *Nose*. And the like is N. in the *Goums*, and Nê in the *Palat*. Thus in *respect* of *Appulse of Organ* P. B. M. are the same; and T. D. N. and K. G. Nê. In *respect of matter of sound* P. T. K. do perfectly agree, and likewise B. D. G. and M. N. Nê. And in *respect of the manner*, viz. Close-

D 4

ness

ness of the Appulse, they *all* agree. And these 3 properties sufficiently discover the Nature of these 9 Consonants, and therewithal, how properly N^g is ranged amongst Original letters. See in a Scheme.

Letters framed by Appulse.	Occluse.		Mute	Murmur-mute	Naso-vocal.	
		Labial	P	B	M	
		Gingival.	T	D	N	
	Pervious.	Palatick	K	G	N ^g	

The other sort of Appulse is *partial* and *pervious*, giving some passage to *Breath* and *Voice*: of which kind, Two are made to the upper Teeth, and cause a *Lisp*ing sound, the Breath being streined through the Teeth. One whereof is of the under Lip to the upper Teeth, which, if Breath onely pass, makes F. but if the Breath

Breath be vocalized, the same Appulse makes V. Another is of the Tongue to the upper Teeth, and in like manner with the former, makes *Th*, and *Dh*. or *θ*. *ς*; which so justly correspond with F. and V. and are made by single proper motions of the Organ, that they must needs be acknowledged *Letters*, and not to be compounded of T and H, or D and H, but require to be described by single proper Characters, as well as other Letters. I would describe them by *θ* and *ς*.

And thus far the nature of these 13 *Consonants* lies fair to be perceived, because the Appulse is so manifest, being either close, as in the former 9; or Bold and forward to the Teeth, as the other 4.

Next, there is a *Partial Pervious*

ous Appulse of the End of the Tongue to the Goums, giving the *Breath* a streight passage there, by which a hissing sound is made ; the sides of the Tongue at the same time resting firmly on the side-Teeth. And by this, if *Breath* alone pass, is made the Letter *S*; but if *Breath* vocalized, then the posture and motion makes *Z*. Again, the end of the Tongue born more downwards, and the middle of it born up nearer the Palate, the sides resting on the Teeth, makes, if the *Breath* pass, *Sh*, or, if *Breath* vocalized, *Zh*. which is properly that, which is designed by *J* consonant, as *For-reiners* pronounce it. The Figures in the mouth of *Zh*. and the vowel *I*, are much alike, which might give occasion of supplying *Zh*. by the
the

the character of J Consonant: And the vowel I, partaking also of the nature of a Consonant, added to Z, comes very near to the sound of Zh, as Zya; but this hath something more of *Gingival* Figure in it.

Thus we have 17 Consonants, which bear a certain Analogie; out of which, if you take M.N. Ng, there remain seven pairs, of which each Letter hath the very same motion and Appulse of the Organs, with his compeer, and differ onely in relation to sound, one being an Articulation of *Breath*, the other of *Voice*, and they

stand thus

p	t	k	f	th	s	sh
b	d	g	v	dh	z	zh

And these

in *Whispering*, cannot be distinguished, except by prejudice of Fancy; but every pair will be the same without any difference, and conse-

consequently but one Letter. So that the *Language of Whispering* is perform'd with 7 Consonants fewer, than the *Language of Speaking*. And I might digresse to tell, how some of the *Antients* may be thought sometime to have used a less number of Letters in their Languages; as may be proved by the celebration of those, who added to their *Alphabet*, by inventing or bringing other Letters, than they used.

And for the other 3 Letters M. N. Ng. though they make not such pairs as the other 14, yet they are within the observation of not differing by Motion or Posture from the other close Letters of the same Organs, but onely by Sound; the Voice passing through the *Nose*, as hath been said. And
it

it were easie to add a *Nasal* Letter to each of the other pair of *Lisping* and *Sibilant* Letters, but they are found not to be so gracefully pronounced, nor sufficiently discriminated in *Perzious* Appulses, where the Breath hath passage through the Mouth and Nose both at once; but onely in the Appulses, which are *Occluse*; where the voice is stopt, and onely murmures within the Mouth, and passeth freely by the Nose. And this is the reason, there are but 3 *Nasal* Letters commonly in use, because there are but 3 *occluse* Appulses. And here it is remarkable, that in the framing of these 17 Consonants, there are but 7 different Motions or Postures of the Organs; and consequently but 7 Discriminations arising

arising from thence, which are between the 7 pairs before spoken of, each pair from the other, in such order as they are there set down.

I shall adde one Remark more concerning these Consonants, That, whereas I have sometimes in discourse, put many *several* persons to consider what the difference might be in any Pair of them, as between P, and B; T, and D, &c. And upon tryal they have been ready to fancy, (and I have met with it in the Writings of some) that the difference lies in the *manner* of *Appulse*, one being made by a Fuller or Ranker Appulse than the other, or, some such thing, which they thought they perceived, but could not well exprefs. The Truth is, There may be

be some such little difference, but from another cause consequential to that which is already assigned, which is this: *All Tuneable Sounds*, whereof Humane voice is one, are made by a regular vibration of the sonorous body, and Undulation of the Air, proportionable to the Acuteness or Gravity of the Tone. Now *Breath* flowing in a smooth stream from the Lungs through the Mouth; and *Voice* from the *Larynx* in a curled vibrated Figure, it may very well be, that *Breath vocalized*, *i. e.* vibrated or undulated, may in a different manner affect the Lips, or Tongue, or Palate (while they stop or check it) and impress a swift tremulous motion, which *Breath* alone passing smooth, does not. And so we may feel

feel within our Mouth, some difference between P and B. which yet is not sufficient to distinguish them to the Ear of another person ; nor of it self to constitute them distinct Letters of the Alphabet ; but they are distinguished by the Sound made by that Vibration.

There remain two odd Consonants, which have no fellows, nor stand in pairs, and those are L and R ; both of them *Gingival* in respect of the Appulse of the Organs. L is made by the same Appulse of the end of the Tongue to the Goums, as are T and D ; but then the Sides or edges of the Tongue are drawn in, and leave smooth and free lateral passage for the voice, *i. e.* by the sides of the mouth, or one of them at least

least. You may easily perceive it, if you pronounce L. after, or before T. *Lt. Tl.* where you keep the end of the Tongue still in the very same posture in both Letters, and onely move the sides of it.

R is made by a *Pervious* Ap-pulse of the end of the Tongue, with its edge to the Goums, the Tongue being held in that posture, onely by the force of the *Geneoglossæ*, or *Myleoglossæ* Muscles, and not resting any where upon the Teeth; except onely touching them loosely, so as to close the passage of Breath every where by the sides, and conduct it to the end of the Tongue; And this with a strong Impulse of Breath vocalized, so as to cause a trembling and vibration of the

E whole

whole Tongue ; which vibration being slow, does not *tune* the voice, but make it *jarre* ; the Tongue not resting, but making a light Appulse in parts of the end of it, and being born stiffely, as with a Spring, by the Muscles, (especially by the *Geneoglosse*) and agitated by strong impulse of Breath. And it is observable, that in all the other Consonants, the *Moveable* Organ rests and bears somewhat strongly upon the *Immoveable* ; as is evident in all the 9 Letters made by *close* Appulse, and in the *Four Dental* Letters, and in *L*, and lastly in the *Four Sibilants*; some of which last being of nearest Appulse to *R*, will shew this better by being compared together ; e. g. *Z*. and *R*. In *Z*. the Tongue bears firme upon the
upper

upper side-Teeth, and so the end of it being a little flatted, is born steadily near the Goums, making a *Rimula*, by which the hissing sound is produced, the steadiness of the posture of the Tongue resisting that tremulous vibration, which it suffers in pronouncing R. But in R. the Tongue does not rest or bear as aforesaid, but is held stiffly in its whole length by the force of the Muscles, so as when the impulse of Breath strikes upon the end of the Tongue, where it finds passage, it shakes and agitates the whole Tongue, whereby the sound is affected with a trembling jarre. And this is the cause, why they, whose Muscles are weak or flacid, are unapt to pronounce this Letter R.

E 2

Now

Now, as before I gave a Scheme of the *Occluse* Consonants with their differences, so I shall here add one of those, which are *Pervious*, and then all together.

Letters framed by Ap- pulle <i>Pervious</i> .		Blasf. ^o	Murmure Blasf	Sibilant	Murmure	Semi-vocal	Semi-vocal
	Labiodental	F.	V.		Sibi	Smooth	har
	Lingua-dental	Th	Dh		lant	or free	ing
	Gingival			S	Z	L	R
	Palatic.			Sh	Zh		

	SOUND	ORGAN	Or thus more properly by Sound or MATTER.	
APPULSE	P. Mute—	Labial—	p.	Spirital.
	B. Murmure-mute	Labial—	b.	Vocal or Murmuring
	M. Nafo-vocal	Labial—	m.	Nafo-vocal.
	T. Mute—	Gingival—	t.	Spirital.
	D. Murm-mute	Gingival—	d.	Vocal.
	N. Nafo-vocal	Gingival—	n.	Nafo-vocal.
	K. Mute—	Palatic—	k.	Spirital.
	G. Murm-mute	Palatic—	g.	Vocal.
	Ng. Nafo-vocal	Palatic—	y.	Nafo-vocal.
Pervious	F. Blæse--	Labiodental—	f.	Spirital.
	V. Murm-Blæse. —	Labiodental—	v.	Vocal.
	Th. Blæse —	Lingua-dental —	θ.	Spirital.
	Dh. Murmur-Blæse-	Lingua-dental —	ð.	Vocal.
	S. Sibilant--	Gingival —	s.	Spirital.
	Z. Murm-Sibilant --	Gingival —	z.	Vocal.
	Sh. Sibilant. —	Palatic —	ʃh.	Spirital.
	Zh. Murm-Sibilant -	Palatic—	jzh.	Vocal.
	L. Semi-voc. smooth-	Gingival—	l.	Vocal-lateral.
	R. Semi-voc. jarring.	Gingival—	r.	Vocal-jarring.

Thus every of these Consonants may be differenced and defined by these three respects,
 1. Sound or *Matter*. 2. Appulse of *Organ*. 3. Manner of *Appulse*.
 e. g. B. is Vocal, Labial, Occluse;
 T. is Spirital, Gingival, Occluse;
 F. is Spirital, Labiodental, Pervi-

E 3 ous ;

ous; and the rest in like manner.

It will give much light to what hath hitherto been spoken concerning *Consonants*, to take a better view of what has been already hinted, and to lay this Hypothesis; viz. That the number of Letters in Nature, is equal to the number of Articulations, severally applied to every distinct matter of Sound. The Articulations of Consonants, *i. e.* the different motions and postures of the Organs of Speech, by which they are formed (though possibly more may be found) I suppose to be 9, whereof I have described 7 in 17 Consonants, and added those of L and R. Now let *Breath* alone, in the Mouth, be first Articulated by these, there will be 9 Consonants,
P.

P. T. K. F. Th. S. Sh. L. R. Secondly, vocalize the Breath, and make the same Articulations, there will again be 9 more differences of sound, and will make the Consonants B. D. G. V. Dh. Z. Zh. L. R. Thirdly, make the same Articulations again, and let the voice pass through the Nose, and there will be 9 differences more, which will make M. N. Ng. V. Dh. Z. Zh. L. R, if the last six be spoken through the Nose, in such manner as we hear it done by those, who (through an ill habit, or by an ill constitution or corrosion of the *Uvula* or Valve, which opens and shuts the passage of Breath to the Nose) are said to speak in the Head, or *Snorch*. Lastly let *Breath only* in like manner pass through the Nose, and have

E 4 the

the *same Articulations*, and there will be nine more different founded Letters, which I cannot describe, but with Characters before used, *viz.* M'. N'. Ng'. F'. Th'. S'. Sh'. L'. R'. Thus there will be by one *Primary*, joyn'd severally with Four *Secondary* differences, four times Nine Consonants, *viz.* 9. Spirital, 9. Vocal, 9 Naso-Spirital, and 9. Naso-Vocal; in all, 36.

But finding no necessity of so many, (since Languages are various enough, and copious with those in use;) and withal, that the 6 *Naso-Vocal* Letters, which are made by *pervious* Appulse, are not easie nor graceful to pronounce, we reject them, and retain onely the Use of the other 3. which are by *close Appulse*,
and

and are facile and graceful, *viz.* M. N. N^ê. And for the same reason we much more exclude 6 of the *Naso-Spiritals*, *viz.* those made by *pervious* Appulse. And for the other 3. though some Nations possibly may take the pains to pronounce them, (especially the last of them, formed in the Palate, N^ê. which perhaps may be the Genuin sound of the *Hebrew* y) yet being found harsh and troublesome, they are more generally disused, whilst most Nations rather study to sweeten and soften their Pronunciation, and to that end are more ready to change or leave out in their Compositions of words, and Conjugations, and words, borrowed from other Languages, such Letters, as less suit with *easie* Pronunciation.

Again

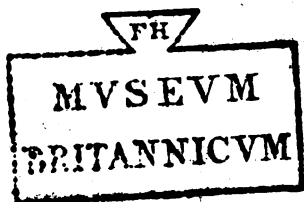
Again, it falls out, that L. and R. being in extreams, one of Roughness, the other of Smoothness and freeness of Vocality, are not easie, in tract of *Vocal speech*, to be pronounced spiritally, as are P. T. F. S. &c. but are apt to get a tincture of *Vocal sound*, (which you will perceive, if you try to pronounce L'a, or R'a, with L and R spirital ;) or else with striving to avoid it to become too *Guttural*; and therefore obtain not a distinct Character, and place in the Alphabet, as Articulations of Breath: Though we meet possibly with something of this nature in the *Welsh* pronunciation of L, and the *Greek* of R. And when amongst them we find LL as in *LLoyd*, &c. or ῥῶ. ῥῆ. ῥῆ. ῥῆ. we may conceive one of each pronounced *Spiritally*,

ly, the other *Vocally*. But in attempting to pronounce these two Consonants, as likewise the *Nasals*, and some of the vowels *Spiritally*, the Throat is brought to labour, and it makes that which we call a *Guttural* pronunciation.

Thus out of 4 times 9. i. e. 36. casting out as useless (or at best, inconvenient and needless) 9 *Nasalo-Spiritals*, 6 *Nasalo-Vocals*, and 2 *Spiritals*, there remain, as proper Elements of Language, 19 Consonants such as are before described. And if they do not all go in equal and parallel Combinations, you see the reason of it. And where some Nations may be found to have a peculiar *Guttural* or *Nasal* smatch in their Language, it will be found also, that they labour to retain in their
pro-

pronunciation (though perhaps not expressed in their Alphabets) some of those Letters, whose use is more generally rejected. And I, not being able to know the distinct usages in all Languages, do not hold my self obliged by the design of this Essay, to accomodate an Alphabet to them all, but think it sufficient in this following *Scheme*, to lay down all possible Consonants, that we know of in nature; (not to speak now of one stop, which may be made in the *Larynx*, of Breath, before it comes to the Tongue and Palat;) leaving it to every ones pleasure, upon their experience of forrein usages, to select out of this common stock more Letters than I do, and remove the *Obelisks*, which are intended for marks of reject.

rejection of those Letters, to which they are prefixed. I have not in this *Scheme* of these 9 Quaternions of Consonants, Distinct known Characters, whereby to express them, but must repeat the same, presupposing those differences of Pronunciation already described.



	Articulations	spirital	Vocal	Naso-	
				Spirital	Naso-vocal
Cloſe.	Labial	P	B	+M	M 3
	Gingival	T	D	+N	N 3
	Palatick	K	G	+Ng	Ng 3
Appuſe					
	Labiodental	F	V	+F	+V 2
	Lingua-dental	Th	Dh	+Th	+Dh 2
	Gingival-Sibilant	S	Z	+S	+Z 2
	Palatick-Sibilant	Sh	Zh	+Sh	+Zh 2
	Gingival-Free	+L	L	+L	L 1
Pervious.	Gingival-jarring	+R	R	+R	R 1
		7	9	0	3 19

In this minute devious ſubject, I have been neceſſitated to explain my ſelf in more words, than to ſome Few may ſeem needful : For their ſakes therefore, I will in

a short review, sum up what has hitherto been said.

Language is a Connexion of Audible signes, the most apt and excellent in whole nature for Communication of our Thoughts and Notions by Speaking. *Written Language* is a description of the said Audible Signes, by Signes Visible. The *Elements* of Language are Letters, viz. Simple discriminations of Breath or Voice, Articulated by the Organs of Speech.

The *Alphabet* consists of so many Letters, as there are to be found such simple Discriminations. And the *written Alphabet* ought to be just so many single proper Characters, designed to signify the Sound or Power of each Letter. And these are the store-house

house of nature; the Elements, and Materials, out of which all Languages are made. These Letters have their *Material* and their *Formal* causes, and *Organs* proper to each. Their *Matter* is various; *viz.* Breath, or voice, *i. e.* Breath vocalized by the operation of the *Larynx*. Their *Form* is constituted by the Motions and Figures of the Organs of speech, affecting the Breath or Voice with a peculiar sound, by which each Letter is discriminated.

Now to find out their *just number*, first find out the different kinds of Matter, of which Letters are made; and these are in general, *Breath* when onely Spirit or Breath is Articulated; and *Voice*, when *Articulation* is of Breath vocalized. And these again

gain more particularly, are either (after they have passed the *Larynx*) onely in the *Mouth*, or else have passage at the same time through the *Nose*. So there are 4 kinds of matter: *Breath-Oral*; *Voice-Oral*; *Breath Ore-nasal*, and *Voice Ore-nasal*.

Next, examine how many *different Articulations* can be made by several *Motions* and *Postures* of the *Organs* in the parts of the *Mouth*, which applied severally to the kinds of *Matter*, may make several *Discriminations* of sound to the *Ear*, *i. e.* several *Letters*. And of these (as to *Consonants*, *viz.* *Letters* made by *Appulse*) I find and have described 9. And if possibly any more may be found out, it is most likely, they will not recompence
F the

the Discoverers pains, by being of ready and graceful use, but will be fitter to be cast out amongst those, to which in the preceding Scheme, an *obelisk* is prefixed. Now by these 9 Articulations with Appulse, there will be framed, Consonants *Spiritual* 9; *Vocal* 9; *Naso-Spiritual* 9; *Naso-Vocal* 9; in all 36. Then rejecting those that prove not graceful, nor easie to be pronounced, *viz.* 2 *Spirituals*, 9 *Naso-Spirituals*, and 6 *Naso-Vocals*, in all 17; there will remain 19 *Consonants*, proper for use according to the design of Letters. And if those, to whom only these 19 *Consonants*, (or about that number) appeared, and stood in such confused order, some in Ternary's, some in Pairs, and some single, were them-

themselves put into so much confusion, and so puzzled to give a methodical and natural accompt of them, it is no matter of wonder. But now looking upon them, as they lie in their original *Differences* and *Combinations*, and as they are selected out of a Natural stock of 9 Quaternions, or 4 Novenaries: I think (if I flatter not my self) their Nature and Differences lye most plain and obvious to be understood.

In describing Letters framed by Articulation, and more particularly, by Appulse, I have hitherto had no occasion to speak of H; since that H is onely a *Guttural Aspiration*, i. e. a more forcible impulse of Breath from the Lungs, applyed when we please, before or after other Letters. And

F 2

if

if we will ascribe any Articulation by Motion or Figure to it, it is onely a more sodain and forcible contraction of the Lungs, and collecting the Breath in the Pipe of the *Aspera Arteria*, and possibly somewhat streitning it in the mouth of it, which is the *Larynx*; and all the formation of it ends there: and thus applyed to a Vowel, or to some of the Consonants, it does indeed affect them with a different sound, and therefore deserves to be considered in this place; though not as a Consonant, having no Appulse; nor as a Vowel, being never Vocal, but affecting onely the Breath, and that by an addition onely of force, but not by any new Figure in the Mouth; and so cannot properly be called a Letter, accord-

according to that description we have made of Letters; yet in that it causes a sensible, and not incommodious Discrimination of Sound, it ought to be annexed to the *Alphabet*, and to be expressed in the written Alphabet, by some appropriate Character, or else (as in the *Greek*) mark of Aspiration.

The Use of it before and after Vowels, is familiarly known; but applyed to Consonants it needs to be more diligently considered, because to some of them we find it very unfitly joyned in our Alphabets and Writing; as when we express the powers of F. V. &c. by *Ph, Bh, Th, Dh*, in which Letters there is not any such *Guttural* Aspiration as H, nor any proper sound of it, neither

F 3 any

any mixture of the Natural sounds of P. B. T. or D. But the other are Genuine simple Letters formed, by different Figures of the Organs, from those of these last, and ought to be altogether expressed by single proper Characters. The mistake, I guess, lies in this, that *Pb* and those other, being made by *Pervious* Appulse, there is some passage of Breath through the Mouth, which by addition of H, (through prejudice taken in with our first *A B C*,) is thought to difference them from P, and those other Close Letters of near resemblance. But if better examined, there will be found another difference besides that of Perviousness of Appulse, or passage of Breath; and that consists in the *Figure* of their

their *Articulation*; P. and B. are *Labial*: Ph and Bb, (or F and V) are *Labio-dental*; T. and D. are *Gingival*; Th. and Db. are *Lingua-dental*. And for their being *Pervious*, you may call them (if you please,) *Perspirate*; but yet they are not *Aspirate*. *i. e.* with such an *Aspiration* as H. Nor can you well joyn H. either before or after any of the 6 Oral *Occluse* Consonants, without an *Hiatus*, if you retein the true figure of those Letters. As for Sh, which also is an Original simple Letter, because our Alphabet wanted a more proper character for it, and the figure of it gives a rounder passage of Breath than S, (*this* hissing in the Goums; *that*, in a larger space, in the Palat,) it was unaptly supplied

F 4

plied by adding H; and the same is *Zh* to *Z*: *Gh*. (as in *Thorough*) is onely an *Aspirate*, and G. ought to be left out. And *Ch* (as we pronounce it) is a compound of T. and *Sh*. or at least T. and Y. As also J Consonant with us, or G semblably pronounced, is compounded of *D* and *Zh*, or D and Y. In WHAT, WHICH, and the like, H is pronounced before W. and so of right ought to be written.

Besides the 9 several Articulations by Appulse before described, I hinted and passed by one, of which yet something may be said, *viz.* the Stop made by closing the *Larynx*; though I thought it not worthy to be inserted amongst the Letters, in that it is applied to Breath immediately as it

it passeth through the *Aspera Arteria*, and not to Breath or Voice *Oral* or *Nasal*, being stopt before it arrives there, or at the Tong; and, being a stop of that Instrument of Vocal Sound, the *Larynx* cannot be vocalized: so that, if it should pass for an Articulation, it could frame but one Letter, and that uneasy and unready to be joyn'd with the motions of other Letters in Speech. It is of some Affinity to K, of a middle nature between K. and H. And this being relaxed may make by a *Pervious* Appulse there, a shaking of the *Larynx*, as when we Gargarize: like as snorting inwards doth by shaking the *Uvula*, and as may be done with the Lips. And this coming still nearer to an Aspiration, a
Touch

Touch of it may perhaps be an Ingredient in the rough Guttural pronunciation of the *Welsh* and *Irish*: And I have heard some *Criticks* pronounce the Greek χ after that manner, but somewhat softer, and our *gh* (as in *Through*) has something of it, being more than a bare Aspiration, if strongly pronounced; and the describing it by a Composition of *g* and *h* shews, that our Ancestors had that Notion of it, as a middle sound between *G* and *H*, though *G* was properly put instead of *K*; for it can have nothing of *Vocal* sound; Voice being raised by stiffe tension of the *Larynx*, and on the contrary this sound by a relaxed posture of the Muscles thereof.

There are other differences of
sound

Sound in Speaking, by which the Tone of several Nations, and oft of several persons in the same Nation, is rendered distinct, which are partly to be referred to their *Alphabets*, and partly to their *Words* and *manner of Pronunciation*, and *Accent*. As to their *Alphabets*, some may be found to take in some Letters, as the *Ore-spirital* L' R' and *Naso-spirital* M' N' Ng'; which others use not, and which (as hath been observed) give a *Guttural* and *Nasal* smatch to their speaking. And in several Languages, sundry of the more graceful Letters in the natural Alphabet, are wholly omitted and disused. Again some being unapt to pronounce some Letters even in their own Language, get a different Tone in speaking. They
who

who have great and long Tongues, cannot so well make that *Perzious* Appulse of the Tongue to the Goums, which S. requires; but are apt to touch their Teeth, and pronounce *Tb* instead of S, which is called Lising. On the contrary they, who have short Tongues, or are Tongue-tyed, are apt to fall short of the Appulse of the Tongue to the Teeth, and oftner place it on the Goums, and say T. and D. instead of *Tb* and *Db*, as *Moder* for *Mother*.

They whose *Palat* is ill formed, (such as are said to want the Roof or Palat of the Mouth) or the *Muscles* of their Tongue are weak and Flaccid, cannot pronounce R. The former for want of fit surface of the Palat to conduct the Breath even and strong to the Goums;

Goums; the later, for want of strength of the Tongue to sustain the jarre.

As to their *Words*, a great difference in the Sound of several Languages ariseth from the sorting of Letters, whereof the Words are framed: some affecting one sort of Letters, some another, to be the most frequent Ingredients in their Words. Some Languages are full of Consonants, as the *Polasque*: some, as the *Italian* and *French*, avoid them: though the *French* write some Consonants, which they do not pronounce, to be *Indices* of the Derivations of their words: and generally more Emphasis and Accent is given to the vowels by our neighboring Nations, than by us *English*.

I have observed a pretty affectation

tion in the *Alleman* and some others, which gives their Speech a different Tang from ours: to soften the *Occluse Gingival* Consonants, by a kind of Mixture or soft addition of a *Spiritual* in the same Articulation, to a *Vocal* producing the Vowel, and making the Consonant end *Spiritual*, which began *Vocal*, as D T. N N'. *Städt'*, *Bädt'*, *Männ'*, &c. And whilst the *Italians* strive, as it were, to cut a thread in their Pronunciation between D and T, so to sweeten it; the *Florentine* comes nearer to T, the *Venetian* to D. And generally, they make the *Occluse Appulse*, especially the *Gingival*, softer than we do, giving a little of perverseness."

Many more Observations of these kinds might easily be made,
and

and are to be found in different Languages, all over the habitable world. And in general, the Freedom or Apertness and vigour of pronouncing (as is particularly observed in the *Bocca Romana*) and giving somewhat more of Aspiration; And on the other side, the closeness and Muffling, and (as I may say) Laziness of speaking (which varieties are found in several Nations comparatively, and by the different natural shapes of the Mouth, and several conformations of the Organs of speech in those of the same Language) render the sound of their Speech considerably different, though they all should use the same Alphabet.

I come now to consider Letters made *without Appulse*, i. e. *Vowels*,
among

among which will be found two or three more to be added to the before described number of *Consonants*.

The *Vowels* are made by a free passage of *Breath Vocalized* through the cavity of the Mouth, without any appulse of the Organs; the said cavity's being differently shaped by the postures of the Throat, Tongue and Lips, some or more of them, but chiefly of the Tongue.

As to the *Number* of Vowels, they, being differenced by the shape of the cavity of the mouth, may be reckon'd very many, if small differences be allowed. But those which are remarkably distinguished, and reasonably suffice to express the pronunciations in use, that we know of, may be
redu-

reduced to these Eight ; *a. a.e.i.o.*
oo. u. y ; the sounds whereof, ac-
 cording to the vulgar pronunciati-
 on, are thus.

<i>Long, or accented in the Vowel.</i>	<i>a a e i o oo u y</i> <i>Fall. Fate. Seal. Eel. Cole. Fool. Rule. Two.</i>
<i>Short, or accented in the Consonant.</i>	<i>Folly. Fat. Sell. Ill. Full.</i>

There is so much space between
a and *e*, that there may be a
 vowel inferted between them, and
 a fit character for it may be *æ*,
 and perhaps some Languages may
 have a distinct use of such a vowel.

Whereas I make the *Material*
 part of Vowels in their *Definition*
 to be Breath vocalized, or voice
 Oral, I am to be understood, as I
 treat of Vocal-Speech ; otherwise
 the same Vowels may be *whisper-*
ed that is, in use of whispering by
 Articulations of Breath ; and , if

G

there

there were any use of it, they may be pronounced *Nasal*, both *Spirital* and *Vocal*; but in *Vocal Speech* they are all *Ore-vocals*, as to common and ready use, and are to be accompted just so many, as there are several *Articulations*, by which they are made.

The *Articulations*, that is, the *Motions* and *Postures* of the *Organs* in framing the *Vowels*, are more difficultly discerned, than those of the *Consonants*; because in the *Consonants*, the *Appulse* is more manifest to the sense of *Touching*, but in the *Vowels* it is so hard to discern the *Figures* made by the *Motions* of the *Tongue*, (inclining onely toward the *Palat*, and not touching it) especially about the more inward *Bosse* or *convex* of it, that it is rendered

dred no less difficult to define the Articulations of the Vowels; and he that can describe them accurately, *erit mihi magnus Apollo.*

Onely he who shall adventure, has this advantage, that it is easier to affirm, than to disprove. Neither are we obliged to seek, nor can expect to find any exact method of nature in the Articulations of Vowels, (as e. g. to find them equally sorted into *Gutturals*, *Palatic*, or *Gingivals*, and *Labials*) no more than were found in those of the Consonants; where, of 9 Articulations, there are *Labial* 1; *Labiodental* 1; *Linguadental* 1; *Gingival* 4; *Palatic* 2; and some of these irregularly differing from the rest. I shall therefore take upon me no more, than to set down, what I think may be perceived

G 2

ceived in examining those Articulations.

But first, to discover how much the middle and inward Bosse of the upper surface of the Tongue is used here, and how little the end of it (except onely to conduct and give way,) you will upon tryal find your self able to pronounce all the Vowels, holding the end of your Tong, all the while steady against your Teeth. And you may come very near, doing the same without altering the posture of your Lips: which evinceth, that all vowels are formed by the Tong, though in some the Lips concur, and in some, the Throat. And whilst you make this tryal, the Motions of the Tongue by Contraction, Dilatation, &c. are so easie and so

so subtil, that you can hardly conceive or distinguish them aright.

But we may imagine the Vowel (*æ*) to be made by the freest and openest passage of the Throat through the Mouth, and so to have a kind of natural Articulation without Art, onely by opening the Mouth: (*æ*) to be a little streitned by the Bosse of the Tongue near the Throat; and therefore if you try to pass from (*æ*) to (*a*) you will find that you thrust the end of your Tong something forward to raise the Bos of the Tong towards the Palat to streiten the passage.

In (*e*) the middle of the Palat is streitned, by the breadth of the Tong, and therefore the end of the Tong carried yet forwarder.

G 3

And

And in (*i*) still more after the same manner, but with a stronger and firmer Tension of the Muscles of the Tong bearing it stiffly very near the Palat, and resting the sides of the Tong against the side-Teeth.

In (*o*) the *Larynx* is depressed, or rather drawn back by contraction of the *Aspera Arteria*. And the Tong likewise is drawn back and Curved; and the Throat more open to make a round passage: and though the Lips be not of necessity, yet the drawing them a little rounder, helps to accomplish the pronunciation of it, which is not enough to denominate it a *Labial* Vowel, because it receives not its Articulation from the Lips. (*oo*) seems to be made by a like posture of the
Tong

Tong and Throat with (*o*) but the *Larynx* somewhat more depressed. And if the Lips at the same time be contracted, and born stiffly near together, then is made *u*. (*u*) with the Tong in the posture of (*i*) but not so stiffe, and the Lip born near the upper Lip by a strong Tension of the Muscles, and bearing upon it at either corner of the mouth.

Thus, it seems, in *oo* and (*o*) the Throat; in (*a*) the Mouth is more opened: in *a. e. i.* the streitnings of the cavity of the mouth between the Tong and Palat, are gradually both forwarder and nearer the Roof.

(*u*) is made by the Throat, and Tong, and Lip. (*u*) by the Tong and Lip; in *u* the Tong being in the posture, which makes

G 4

(*oo* ;)

(*oo* ;) and in (*u*) in the same posture, which makes (*i* .) And in this, *u* and *u* are peculiar, that they are framed by a double motion of Organs, that of the Lip, added to that of the Tong; and yet either of them is a single Letter, and not two, because the motions are at the same time, and not successive, as are *en. pla. &c.* Yet for this reason they seem not to be absolutely so simple Vowels as the rest, because the voice passeth successively from the Throat to the Lips in *u*, and from the Palat to the Lips in *u*, being there first moulded into the figures of *oo* and *i*, before it be fully Articulated by the Lips. And yet, either these two, *u* and *u*, are to be admitted for single Vowels, or else we must exclude the Lips from being

being the Organs of any single Vowel since that the Mouth being necessary to conduct the Voice to the Lips, will, according to the shape of its cavity, necessarily give the Voice some particular affection of sound in its passage, before it come to the Lips; which will seem to make some such composition in any Vowel which is *Labial*. I have been inclin'd to think, there is no *Labial* Vowel, but that the same affection from the Lips may, somewhat in the nature of a Consonant, be added to every of the Vowels, but most subtly, and aptly to two of them, whose Figures are in the extremes in respect of Aperture and Situation, one being the closest and forwardest, which is *i*, and the other being most open and back-

backward ; there being reason to allow a Vowel of like sound in the Throat with *u*, but distinct from it as not being *Labial* ; which will be more familiar to our Eye if it be written *oo* ; as in *Cut, Coot, Full, Fool, Tut, Toot*, in which the Lip does not concur ; and this is that other. Thus *u* will be onely *i Labial*, and *u* will be *oo Labial*, that is, by adding that motion of the under-Lip, *i* will become *u*, and *oo* will become *u* ; and then the Series of the Vowels according to their degrees of aperture, and recess towards the *Larynx*, will be thus, *i, e, æ, a, æ, o, oo* ; to which may be added *u* and *u*, because of their general use, as being *Labially* affected more subtly than the rest.

Taking these then for *Vowels*, it
is

is next observable, that *i. u. &c.* have another peculiar property above the other Vowels, being made by a strong Tension and firme posture of the Organ ; the first, of the Tongue, the two later, of the Lip, making almost an Appulse, that by reason thereof they serve indifferently for *Vowels* in respect of the *Aperture*, and for *Consonants* in respect of the *pene-appulse*, and so much the more verging either way, by the liberty of managing the Organs, according to the respective Occasions.

And it is here observable, how excellently Nature has provided for the *Readiness* and *Easiness* of Speech. For if Speech were to be made onely by *Vowels*, there would be an *hiatus* ; we could not speak distinct enough, and the
Breath

Breath would spend too fast; therefore it is checked by the Appulses made in Consonants; and if it should be all Consonants, the Voice would be too much abated, and the passage would not be easie from one Syllable or collection of Letters to another; but being both mixed together, one Vowel in every Syllable, for varieties sake, sometimes preceding, sometimes following, and sometimes interposed between the Consonants (by checking and reserving the Breath, and letting it pass with a quick impulse at the Aperture of the Organs for the Vowel) give a vigor and emphasis to the Sound : And the motions of the Organs become more facile and ready by the mixture of *Apertures* with *Appulses*.

But

But in these three Vowels, of which I am now treating, there seems to be a kind of *Lusus Naturæ*; these are of a middle constitution between Vowels and Consonants, partaking of both: and we see, how many disputes, their simple and ambiguous nature hath created among the *Grammarians*, and how it has begot the mistake concerning *Diphthongs*; they being all, that are accounted properly such, compounded either with *i. u.* or *y*, and are, as I conceive, *Syllables* and not *Diphthongs* (as it is intended to be signified by that word :) *i. y.* and *u.* then supplying the place and nature of Consonants by strengthening the passage of Breath, so as to check it not much less, than is done by some of the *Previous* Conso-

*Vid. Ap-
pend.*

Consonants, and by making a smart stroke at the Aperture in passage to another Vowel, answerable to the Collision, or rather Divulsion of the Organs made by other Consonants, as is evident in pronouncing *ia*, *ya. id est ya. wa.* For the same reason, of the improper *Diphthongs* the most passable are those compounded with *e* or *o*, as *ea*, *oa*, because of the nearness, that *o* has to *u*, and *e* to *i*, and having either of them a little of that Spring in the Muscles, which I have last described.

Concerning *u* and *n*, this may be observed, that in subjoyning them to another vowel, *u* is apter to follow *a* and *o*, because of their resemblance in the posture of the Tong, as hath been said; and for the like reason *n* is apter to follow

low

low *a* and *e*, as *earl*, *wawl*. *euge*, &c. But generally if the Vowels follow, then it is *s* precedes, and not *u*.

Our vulgar (*i*.) as in (*stile*) seems to be such a *Dipthong* (or rather syllable or part of a syllable) composed of *a. i.* or *e. i.* and not a simple Original Vowel.

I may now give you a Scheme of the whole Alphabet.

Letters, *i. e.* such simple Discriminations of Sound as may be Elements of Signes for communication by Speech, are differenced by

Manner of Sound, prepared by the Lungs, Larynx, Mouth, Nose.	{ Breath Voice.	{ Oral Ore-Nasal. Oral Ore-Nasal.	(and may be stilled)	Ore-spiritual.
				Naso-spiritual.
				Ore-vocal.
				Naso-vocal.
Forme, Articulation by	Appulse of one Organ to another, Consonants by degree	{ Plenary Close	{	Lip to Lip. Labial, as B.
				Tong to Gums. Gingival, D.
				Tong to Palat, Palatic, G.
				Lip to Teeth. Labiodental V.
		{ Partial Pervious	{	Tong to Teeth, Lingua- Dh.
				(dental
				Tong to { Sibilant. Z.
				Gums, { Jarring. R.
				Gingival { Lateral. L.
				Tong to Palat, Palatic. Zh. or J.
Inclination of one Organ to another without Appulse.				
Vowels— <i>a. ă. 2. e. i. o. oo. u. ȳ.</i>				

Thus there are 9 Articulations with Appulse, which applied severally to four sorts of matter, viz. *Breath-Oral, Breath Ore-nasal, Voice-Oral, Voice-Ore-nasal*, may make 36 Consonants; whereof I have instanced in one to each Articulation, having before described other three to each Articulation. And likewise nine Articulations without Appulse so applied, may make 39 vowels.

H. Of

Of these some are

Commodious { **Consonants** { Ore-spirital, 7. p. t. k. f. th. s. sh.
Ore-vocal, 9. b. d. g. v. dh. z. zh. l. r.
Naso-vocal, 3. M. N. Ng.
Vowels, Ore-vocal → 9. a. æ. e. i. o. oo. u. &

Uneasie and unpleasant, or not sufficiently distinct. { **Consonants** { Ore-spirital 2. L' R'
Naso-spirital 9.
Naso-vocal 6.
Vowels { Ore-spirital 9. *viz.* in vocal speech, (of
Naso-spirital 9. which I am treating)
Naso-vocal 9. but in whispering they
are commodious.
Of intermediate Figures without determinate number.

The Vowels, in respect of their Articulations, may seem not unfriendly to be sorted into { **Guttural** ——— oo. o. æ.
Palatic ——— a. æ. e. i.
Labio-Guttural ——— v.
Labio-Palatic ——— u.

There are some other Accidents besides those spoken of before, which have an Influence in varying the Sound of Languages, as *Accent* and *Emphasis*; which though now much confounded, seem to have been formerly more distinct.

distinguished. *Accent*, as in the *Greek* names and usage, seems to have regarded the *Tune* of the voice; the *Acute* accent raising the *Voice* in some certain *Syllables*, to a higher, *i. e.* more acute *Pitch* or *Tone*, and the *Grave* depressing it lower, and both having some *Emphasis*, *i. e.* more vigorous pronunciation. The *Circumflex* keeps the voice in a middle *Tune*, and therefore in the *Latine* is compounded of both the other, but withal adding an *Emphasis* and longer stay upon that *Syllable*, expressed in *Greek* by a suitable character [~] And therefore the *Syllable*, which is circumflexed, is always accounted long. This *Tuning* of the *Voice* by *Accent*, is of great concern to the *gracefulness* of pronunciation.

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And

And although our Languages have not such accurate Rules for it as the *Greek* had, yet it is much considered, and submitted to the judgement of more Critical Ears, to direct and determine what is graceful, and what is not; and here arises a difference in the Sound of Languages, by the different Use of Accent. For example, the *French* and *Greek* run contrary one to the other: Whereas the *Greek* in the end of a word changeth the *Acute* accent to a *Grave*, and most Languages have somewhat like (which is therefore called *Cadence* of their voice;) the *French* conclude with an *acute* Accent, raising the Tune of their Voice in the *last* Syllable.

Emphasis is of a larger consideration and extent, and not so much regards

regards the Tune (leaving that to Accent) as a certain *Grandeur*, whereby some Letter, Syllable, Word, or Sentence is rendered more remarkable than the rest, by a more vigorous pronunciation, and a longer stay upon it : As, in a *Speech* some Sentences are made more remarkable, in a *Sentence* some one or two words; in a *Word*, some one Syllable; and in a *Syllable*, some one Letter. And of these *Two* last I am chiefly here concerned to take notice.

In a *Poly-syllable* word, it is first to be considered, to which Syllable the *Emphasis* is to be given, and in each Syllable, to which Letter the former of these is usually confounded with Accent; but in the later lies the greatest difference of Pronunciation, the

Consonants coming in for a share of *Emphasis*, and making a Syllable long, where the Vowel is short: E. g. *Altera*, in respect of the whole word, the *Emphasis* and *Accent* lies in the first Syllable, but then that Syllable is again capable of a two-fold *Emphasis*, viz. either in the Vowel or in the Consonant. Most Foreigners pronounce their Vowels soft, as this they pronounce *Aaltera*, or *Aultera*, staying upon the Vowel, and making a soft gentle Appulse in the Consonant; *We* are apt to pronounce it *Altera*, making the Vowel short and giving the *Emphasis* to the Consonant. And this kind of *Emphasis*, viz. of the Consonant, is apt to gain too much place in our Speech, and I take it to be a general vicious habit in our pronun-

pronunciation, as they, who learn to sing, will find; for their first attempt must be, to unlearn that habit. So also We say *Fôrma*, they, *Fôrma*, or (as we would write it, if it were *English*) *Forema*. We say, *Môrtem*; they *Moretem* or *Moortem*. We say, *Consonant*, they *Cônsonánt*, or, *Conesonaunt*. We say, *Catt*, they, *Cant*. Yet something may be said on our behalf, that giving an Emphatical Sound to the Consonants, makes our Pronunciation more distinct, and certain to the Ear. And here it may be proper to assert, that there is no such thing in nature as a *double Letter*, either Consonant or Vowel, in one and the same Syllable, and it is incongruous, to write them so. For where-

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have one and but one determinate signification, to express the power of some one certain Sound made by the Mouth; with more than *Poetical* Licence one sign is set for another, and the same Letters in the same Alphabet in several words, are made to have several powers. Thus in our *English*, *ee*, and *ie*, and *e*, for *i*, (as *Feel, Field, English*;) *oo* for *u*, &c. And frequently the *Emphasis* is incongruously supplied by adding quiescent Letters (the Phrase confessing the absurdity) as *Bate Batt, Base Basse, Bare Barre*. But I do not intend to pursue the many *Pseudography's* in use, which are too numerous; but to shew of how great concern the *Emphasis* were, if rightly used; and how most of those *Anomalies*

lies in writing might be avoided, and better supply'd by noting our Words or Syllables, that need it, with some mark of *Emphasis*. This will shew, when a Vowel is to be pronounced long or short, and cut off superfluous Quiescent Letters, and double Consonants: for, when there is a double Consonant written, though sometimes it changeth the Vowel, *Ale, All, Cale, Call*; yet generally it serves to transfer the *Emphasis* from the Vowel to the Consonant.

This kind of *Emphasis* then, I mean not the *Emphasis* of a Syllable in reference to a word, but the *Emphasis* of a Letter in respect of Syllables, as it is to belong either to the Vowel, or to the later Consonant (if there be any) in the same syllable, if it were better heed-

heeded, and noted by some mark, would conduce much to *Orthography*; as for example, if an Accent were placed over the Vowel, or else over the Consonant, as the case requires, *ál*, *al'*, or rather, leaving the Accent to mark out the Syllable in a word, to which *Emphasis* is due, where need is; make use of long and short Characters set over the Vowel, and to make the least work, suppose every Vowel to be long, which is not marked, and mark onely those Vowels, which are to be pronounced short, and the *Emphasis* transferred to the following Consonant. Thus instead of *Ball Boll*, *Bale, Ballad; Beal, Bell; Biele, or Beeh, Bil*; write *Ba^l, B^al; Ba^l, B^alad; Be^l, B^el; Bi^l, Bi^al*: I say, if our pronunciation were written in proper

proper Letters, and with marks of *Emphasis*, it would restore *Orthography*, and cut off many superfluous Letters that are written, not to be pronounced, but onely to make an incongruous supply of *Emphasis*, or to alter the power of some other Letters in the same word; whereof in some Languages so many examples are found, that it would be tedious to recount them. In the mean time we are apt very unjustly to laugh at the uncouth Spelling in the writings of unlearned persons, who writing as they please, that is, using such Letters, as justly express the power or Sound of their Speech; yet, forsooth, we say write not *true English*, or *true French*, &c. Whereas the *Grammarians* themselves, ought rather to

to be blamed, and derided for accommodating Words so ill with Letters, and Letters with so faulty *Alphabets*, that it requires almost as much pains to learn how to pronounce what is written, and to write what is spoken, as would serve to learn the Language it self, if Characters or Signs written were exactly accommodated to Speech. But, though it be true, that this so needless and unprofitable incumbrance of Learning might wholly be removed by rectified Alphabets, and settling a just correspondence between the Signs *Audible*, and the Signs *Visible*, if such *Alphabets* and a regular usage of them could take place; yet it is not to be hoped or imagined, that the incongruous Alphabets, and Abuses of writing

writing can ever be justled out of their Possession of all Libraries and Books, and universal habit and practice of Mankind. This were to imply, that all Books in being should be destroyed and abolished, being first new Printed after such rectified Alphabets; and that all the Age should be prevailed with, to take new pains to unlearn those habits, which have cost them so much labour. Neither did any such Hopes or Ambition set my thoughts on work, but *partly* the worthiness and curiosity of this Subject in it self, and *chiefly* the great use of an accurate knowledge of the Nature of Letters and Speech, in directing to a steady and effectual way of *Instructing Deaf and Dumb persons*, to obtain a reasonable perfection of
of

of utterance of Speech; and to discern (in some measure) with their Eye, by observing the motions of their Mouth, what others speak. And to that end I have added to this Essay an *Appendix*, relating that design; both which I hope and promise my self, will find a Candid reception from those, who shall consider these poor and flight Papers, as a work of Charity and Compassion ; and may be acceptable to them, as it is pleasing to my self, to have studied some relief for the Calamitous and Deplorable Condition of persons Deaf and Dumb.

APPEN-



APPENDIX

Concerning Persons

D E A F

AND

D U M B.

Amongst *Dumb* Persons, there are very few, who are such through defect in the Organs of Speech; but most commonly that Imperfection is the effect, or rather consequence of *want* of *Hearing*, by some disorder or defect in the Organs appertaining to that Sense. The Organs of *Speech*

Speech are many and large, and managed by so great a number of Muscles, that Speech is not easily destroy'd, though often somewhat vitiated, as to some particular Letters, and as to ready pronunciation in general; but they, who have such Imperfections, are not thereby utterly deprived of the Use of Speech: whereas the *Organs of Hearing* are few and small, and a little disorder or defect wholly overthrows the use of that Sence. There are three very little Bones in the Ear, upon whose right constitution, depends the due Tension of the *Tympanum*; and if the action of one little Muscle, which serves to draw one of these *Officles*, fixt to the *Tympanum*, be lost or abated, the *tension* of that Membrane ceasing,
Sound

Sound is hindred from coming into the Ear : And I am of opinion, that the most frequent *cause* of *Deafness* is to be attributed to the Laxness of the *Tympanum*, when it has lost its Brace or Tension by some irregularity in the Figure of those Bones, or defect in that Muscle : Some instance whereof, I have formerly given in a Paper presented to the *Royal Society*, * * See the end of this Discourse. whereby Sound is, as it were, shut out of doors by the intervention of that Laxe Membrane, and not suffer'd to pass into the inward Ear, and arrive at the *Auditory Nerve* : Like as the Voice is sometimes intercluded by a hoarseness, or viscus phlegme, cleaving to the *Aspera Arteria*, *Larynx* and *Uvula* ; so that, although there be no fault in the Organs of

I Articulation.

Articulation, yet there is no voice to be Articulated.

Now as to the most general case of those who are *Deaf and Dumb*; I say, they are *Dumb* by consequence from their Deafness, only because they are not taught to speak. The *Natural part of Speech*, viz. Words made of Letters, by such exquisite various Articulations, is learnt by much practice and imitation. And much more the *Artificial part*, viz. Institution of Significancy of Language, cannot be acquired without great help of Instruction. And to that end the Tong and the Ear, Speaking and Hearing, hold a correspondence, by which we learn to imitate the Sound of Speech, and understand the meaning of it. But he that never hears a word spoken, nor can

can be told what it signifies, it is no wonder if such an one remain speechless : as out of question any one must do (though of integral principles) who from an Infant should be bred up amongst *Mutes*, and have no teaching. Such then is the case in hand, that they who want that *Sence* of *Discipline* (*Hearing*) are also by consequence deprived of Speech, not by any immediate *Organical Indisposition*, but for want of *Discipline*.

Finding then a Person in this condition, not capable of *Hearing* ; if we would endeavour to make use of the *Organs of Speech* (supposed to be of sufficient constitution) there is no way, but to have recourse to the other *Learned Sense*, which is *Seeing* ; and

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to

to find out some means (though farther about and more laborious) of instructing him by his Eyes, and shewing him the visible motions and figures of the Mouth, by which Speech is Articulated. And to apply the Doctrine of Letters to this use and purpose, is the Design of this *Appendix*. Where our first business had need be, to Animate the *Undertaker*, and consider, *whether* it be possible or no: For it must be confessed, that there lie in the way great Objections and Difficulties, which seem to discourage, and portend such a design unfeasible. But I doubt not to shew you, how to overcome those seeming demonstrable Impossibilities, and shew, how truly it is said, *Venit miseris solertia rebus*.

The

The *First* difficulty which occurs, is, that it will be painful and irksome to a deaf Person to *exercise* his Voice, as even those, who have no defect, are apt to be tired and spent with much speaking, and find a hoarseness in their Voice, and weariness in the Lungs and Muscles of the *Larynx*; and it will be very hard to prevail with him to submit himself to so troublesome a course of Learning; being Deaf to all persuasions and arguments, by which we might excite him to it. I confess, this *Objection* stands upon the threshold, as a great discouragement. And except a great regard be had to it, who ever goes about this design, will attempt it in vain, especially in the first progress in it. Therefore the

Deaf Person must be gently and discreetly treated, and by all kind of pleasant usage wrought upon, to take some pains at it; watching your seasons, and taking great care, that he may not hate his task, but do it cheerfully. He must be allured by much sweetness, and encouraged, as oft as you have the least occasion, by applause and admiration; and must exercise *often*, and a *little* at a *time*, so as not to vex and weary him; and in some time, habit and custom, and the pleasure he will take in it, will make it easier to him.

2. Some of the Consonants, and most of the Vowels, being Articulated by so *obscure Motions* and *Figures*, that the most Learned can hardly agree to describe them, it may well be doubted how they

they can be described to the Eye of Deaf Persons. And further, if all the 9 Articulations of the 19 Consonants were understood and imitated by him; yet how can he discern the *Material Differences*, which make up the number of Consonants, and consist only in Sound, and cannot be represented to the Eye.

The *former* part of this objected difficulty is easily answered by saying, that in Ascents, every step gained is a footing and help to the next: and in the Elements of *Geometry*, the Definitions, and Axioms, and Postulata, and easier propositions, serve to elucidate, and demonstrate harder *Theorems* and *Problems*. Thus you will find, that when you have conducted him through the plainer

part of the *Alphabet*, he will begin so far to understand his task, that more imperfect descriptions will serve to carry him on to the end of it.

As to the second part of this objection, it must be confessed a thing not feasible to represent the *Material Difference* of Consonants to the Eye ; Sound being onely the object of Hearing : Yet the *Nasal Differences* may be pointed at ; but those *Seven pairs*, before discoursed of, cannot be distinguished by *Sight*. And in this case it is chiefly that I said, the designe must be compassed by a way further about ; and such a way I shall direct in its proper place, which shall easily and certainly effect it.

3. Supposing a Deaf person to
have

have gained a perfect pronunciation of all Letters and Words, and that all the Articulations were to be discerned by his Eye, in the Mouth of one who speaks to him; yet this, as to Consonants, could discover but 9 differences, and must leave 10 Letters and indeed all undistinguished: so that it is impossible to discern certainly what Letter is pronounced. And then it must likewise seem impossible (what is so frequently spoken of and attested) for a Deaf Person, by observing the Motions of another mans Mouth, to know what he says, and to uphold a current communication of discourse with him.

This *objection* seems unanswerable, and the difficulty not to be conquered; and it must be granted

ed, that it is impossible to know *infallibly* by the Eye, what another speaks. But yet there is an equity and relief in this Case, as I shall make appear in cases not much different. As First, Any *Equivocal* word spoken *alone*, cannot be determined to any one certain Sense and Signification by him that hears it; of which there are numerous examples in every Language: Yet the same word in *Connexion* of Speech, as part of a sentence, is understood as easily as any other; ex. gr. *But*: if I ask you, what I mean by that word, you will answer, I may mean this or that thing, or something else, you cannot tell which: you can distinguish, but you must leave me to determine; but if I joyn it with other words in *Construction*

struction and Sense, as (*But* I will not. (a *Bnt* of *Wine*.) *Bnt* and *Boundary*) the Ramme will *Bnt*) (*Shoot at a Bnt*) ; the meaning of it will be as ready to you , as any other word. In like manner if the Deaf Person discern with his Eye one single Articulation , suppose by the Appulse of the Lips, he cannot distinguish whether it be *p. b.* or *m.* But this same Articulation joyned with others, in Words and Sense, he having a general perception of the subject, whereof you discourse, and a greater than ordinary measure of Sagacity, will not be to seek , which of these three *Labial* Consonants you used.

There is a common experiment, which will come still near to the case in hand ; in *Whispering*

ing, we Articulate onely *Ore-spiritual*, and *Naso-spiritual* Sounds, and yet use words, which consist much of *Ore-vocal*, and *Naso-vocal* Consonants, and have no other difference from other Consonants of the same Articulation, but that they are Vocal. And these *Vocal* Letters in *Whispering* we make *Spiritual*, and so they come to be the very same, each with his compere, which is *Ore-spiritual*; of which I have given 7 pairs in the discourse foregoing. Now, though *b* and *p*, *t* and *d*, *k* and *g*, *f* and *v*, *th* and *dh*, *s* and *z*, *sh* and *zh*, are but in effect 7 Letters, and have no distinction at all, each from his Compere, in *Whispering*, neither in respect of *Organ*, nor *Articulation*, nor *Sound*: and therefore being singly pronounced, can-

not

not be distinguish'd neither by the Eye nor Ear; yet we are not at all perplext with the confusion of these Letters in *whispering*, but by our habit and knowledge of Language, can as readily understand one another, when we whisper, as when we speak aloud: & yet these Consonants are not much less confused to the Ear in *Whispering*, than in *Speaking* they are to the Eye.

It is observable, that the Histories of those, who could discern *Speech* by their Eye, are most of such, as having had knowledge of Language, and a readiness in Speaking, falling afterwards into Deafness, have lost the *use* of Speech, but still retain the *memory* of it. Now if we can by Industry, make our Deaf and Dumb Persons reasonably perfect in

in the Language and Pronunciation, he may be also capable of the same privilege of understanding by the Eye what is spoken, though the Letters singly pronounced are ambiguous and may deceive him. *In short*, though it be impossible for a Deaf Person, by his Eye accurately and certainly to distinguish Letters *singly* spoken, (as it is likewise in words equivocal spoken, and Letters whispered, to those that hear ;) Yet in tract of Speech, as a dubious word is easily known by the Coherence with the rest ; and a dubious Letter by the whole Word ; so may a Deaf Person, having attained a competent knowledge of Language, and assisted by an acute Sagacity, by some more evident word discerned by his

his Eye, know the Sence, and by the Sence other Words, and by the Words the obscurer Letters ; and so, notwithstanding this difficulty objected, make good use of this Institution, not onely to speak, but, in a good measure (so far as to serve for converse) know what others say to him : And the rather, because having learnt by his Eye, and being inured to that kind of observation, he is quicker to perceive the Motions of Articulation, and Conjunctions of Letters in Words, than we can easily imagine.

Having thus surmounted the difficulties, I shall mention some such things as give encouragement to this enterprize. And *First* that, which was before hinted, that in Deaf and Dumb Persons, their

their *Necessity* excites a great observation and sagacity to supply their defects, and to bear up and maintain *Converse* with others, who enjoy the benefit of all their Senses. And being denied Communication by the *Ear*, their *Eyes* are the more vigilant, attent and heedful, which renders them much more capable of being improved by directions and instructions applyed to that Sense, and gives a delight and encouragement to those, who teach such apprehensive Scholars.

2. The onely moveable Organs belonging to the Sence of Hearing, being Two of those Three little *Bones* before mentioned, *viz.* the *Incus* and *Malleus*; and so much depending upon the adequate motion of those
Two

Two *Offices* to give due Tension to the *Tympanum*, their Motions being small, are easily subverted, and from thence most frequently comes *loss of Hearing*. Now that which I would infer, is, That in *those* generally the *Auditory Nerve*, is sound, and by a *branch* of the same *Nerve*, that goes between the Ear and the Palat of the Mouth, they can make a shift to hear themselves, though their outward Ear be stopt by the Laxe Membrane to all Sounds, that come that way; and so they have some little pleasure in speaking, and guide themselves by that little Hearing, to retein, and improve a habit of Speaking whatsoever they have once been taught.

3. The *Figures* of some Articulations are most easie to be
K shewed

shewed to the Eye, as the Consonants *Labial, Labiodental, Lingual, and Gingival, and Palatic, Occluse, and the Gingival-Lateral*; so that who soever makes trial, shall begin to make some progress with great success and encouragement, and gain ground to make the remaining part of the *Alphabet* more easie, by the habit and method of prevailing so far onwards.

4. *Language* being defined, a *Connexion of the best Signes for Communication, and Written Language, Visible signes of the signes Audible*; And the *Elements of each respectively, and the correspondence and mutual assistance of each to other, being such, as in the foregoing discourse is more fully shewn*; You have a great help

help, by *shewing* Letters and Words *written*, to conduct a Deaf person on, in exercising him to express the same by pronunciation; and what soever you gain upon him *this* way, will be retained, and made use of in the *other*. Add to all this the admirable Curiosity and singular Excellency of this designe, the consideration wherof will sustain the Patience and animate the Industry of him who shall undertake it.

Having thus considered what ground and encouragement there may be for such an undertaking; I shall now in the plainest manner I can, lay down such *Directions* and *Rules*, as I my self have made trial of, to instruct a Deaf person to make use of his Organs of Speech, and cease to be Dumb,

K 2

enjoy-

enjoying the great felicity of that most expedite way of Communication: Which may serve, till some more able Person shall be excited, by Improvements and Additions, to give a greater Perfection to this designe.

First make your own *Alphabet* according to the Number of Letters and their Natural order. In respect of easiness, Consonants first (because their Appulses are manifest) and then Vowels; and in ordering Consonants respect chiefly, either

Their { Sound—p. t. k. f. θ. s. sh. b. d. g. v. ʒ. z. j. m. n. ŋ. l. r.
 Organ—p. b. m. f. v. θ. ʒ. t. d. n. s. z. l. r. sh. j. k. g. r.
 Degree—p. b. t. d. k. g. m. n. ŋ. f. v. θ. ʒ. s. z. sh. j. l. r.
 of Appulse.

The last of these I take to be much the best order, in which to teach a Deaf Person. Then, add the Vowels, *æ. a. æ. e. i. o. oo. u. ʒ*: but so accurate a distinction will not

not be necessary. The through-understanding of the nature of this *Alphabet*, will direct you, *what* and *how many* are the Articulations of Letters, which may be represented to the Eye; and what are the other differences of Letters, that you may invent some other Artifices, besides visible representation, to make a Deaf Person learn and apprehend them. This *Alphabet* must be your own *Clew* to guide you; but the Deaf person is not to be troubled with it, because he is also to learn to write and read as others do; and therefore must be taught the common *Alphabet* of that Language, which he is to learn, and must use those incongruous compositions, and other Anomalies of vulgar writing; in which you must understand

how to manage him, by Reduction of them to the true Alphabet of Nature ; in which practise, you will (to your cost) discover the inconvenience of faulty Alphabets and Usages of writing.

Let him first learn to write after a *Copy* of all the Letters in the vulgar Alphabet, till his Eye be well acquainted with their Figures, and he be able to write them pretty well. When you begin to teach him to speak, you may use this method. Write down in a paper *p.* and *b* ; and make signes to him to endeavour to pronounce, and guide him by shewing him the motion of your own Lips, to offer at one of those Letters : which being the easiest of all, he will with a little endeavour stumble upon one of them.

Shew

Shew him upon the Paper the Letter, which he hits upon, and much applauding and encouraging him, make him repeat it often, till he be very perfect both in the pronunciation and in the written Character of that Letter : suppose it was *P*. Then next point at *B*. and direct him with the same motion of his Lips to pronounce it. With long trying he perceiving, that you require him to make a different Letter with the same Figure of the Mouth, will at last find out how to do it, and utter something different from *p*. which will be *B*, though he understand not, wherein the difference lies, but finds it out ; and being excluded from *p*, and labouring to pronounce another Letter with the same Figure of

B.

K 4

his

his Lips, make him perfect in B. And let him diligently practise these two Letters, pointing sometimes at one, sometimes at the other in the paper, till he be perfect in both.

Next shew him the posture of the end of the Tongue close to the Goums, and he will without much difficulty be brought to pronounce either *T*, or else *D*. Use the same method as before, and which soever he speaks, shew it him written, and having the other also written in the paper, shew him *that*, after he has con'd the *First*, and require it of him, still keeping the same posture of the Mouth: which having obtained of him, make him perfect in them both, before you carry him further. Next teach him in like manner

manner *K* and *G* calling them *Ka* K.
G.
and *Ga*; but to shew him the posture of these, you had need provide a Palat with the upper jaw, of Plaster, and the shape of a Tong of stuffed Leather, which will be useful to you to describe to him, how the Bosse of the Tong in these Letters is born close in the inner part of the Palat near the Throat; and more useful, when you would describe the Vowels: but yet both may be done without it. If you find him stick at this Letter, put your finger to the out-side of his Throat, whilst he is offering to pronounce, and check his Breath there, and he will soon perceive what he is to do, and can scarce choose but speak *K*. When he has got one of these Letters perfect, gain the other

ther by the same way of *Exclusion*, as before.

Having thus gained of the *Oc-
clude Consonants*, three *Ore-spi-
rital*, *p. t. k.* and three *Ore-vocal*,
b. d. g.; there remain the three *No-
se-vocal*, *m. n. ng.* which will be
most easily learnt by the same
way of *exclusion*, requiring him
to pronounce a *Labial* Let-
ter, that is, neither *p.* nor
b. and pointing to his *Nose*, to
breath that way, he will soon pro-
nounce *m.* and in like manner *n*
and *ng.*

The *Dental* Consonants are ve-
ry easie, therefore let them be the
next, and first the *Labiodentals*,
f, v, which, as also the *Linguadental*,
th, dh, he will soon learn by
the method before directed;
though *dh* may be let alone, being
never

never written so in our Language. But since a Consonant, or at least some of the Consonants, cannot well be pronounced alone, without a Vowel joyned to them, it may be considered here, whether in naming the Consonants, it is better that the Vowel go before, or follow it? and what Vowel? In our *vulgar* Alphabet, it is observable, that in all *occlude* Consonants, except the *Nasals*, the Vowel follows, as *be, ce, de, ge, ka, pe, qu, ve*; but in the *perforious* Consonants, and the *Nasals*, because they have passage through the Nose, the Vowel precedes; as, *ef, el, em, en, er, es*: only *w* hath something peculiar; and in that it is accounted a double Letter (which it is not in the *Natural* Alphabet, any more than *S*,)

we

we may imagine it to have been anciently pronounced, as it is now by the *Italians*, *Ds* or *Ts* ; and so to be called *Zad* from the *Hebrew Tsadi*: but yet to make out my observation, we, who pronounce it as a single Letter, do as often call it *Tzard*.

Now, as to our present purpose, we need not be curious, How, nor which Vowels we joyn to the Consonants, since every way they serve to express the power of the Consonant audibly, which is all that is intended ; but onely our regard must be to choose the way, that may seem more easie ; to which end, such a pronunciation, as this that follows, may be suitable: *be, ce, de, fa, ga, he, ja, [zha] ka, la, ma, na, pe, qu, ra, sa, te, va, wa, eks, ya, za.* The reason why
I

I place the Vowels after the Consonants, is, Because the opening of an *Appulse* before a Vowel has a smart Spring and force of the Muscle, the motion being assisted by the Impulse of Breath, and so is more sensible, and consequently more easie to be observed and learnt, than the shutting of the Organs to make an *Appulse* (*i. e.* a Consonant) after a Vowel, because in this the Motion is *resisted* and hindred by the force of Breath, as much as it was *assisted* in the other.

This is eminently seen in the *Vowel Consonants*, *Y, W*. For when they precede, as *Ya, Wa*, there is none but is easily perswaded, that they are as Consonants, but when they follow, as *Ay, Aw*, their force is so abated, that they are mistaken

ken for *meer* Vowels. And so, as I conceive (but with submission to better Judgements) came in the Notion of *Diphthongs* into the world ; in all which , that are accounted properly such , either *I* or *W* , or (which is the same in effect) *i* or *u* , follow the other Vowel , as *ai* , *ei* , *oi* , *au* , *eu* , *ou* : onely the *Greek* hath *ui* , which if it is to be pronounced in one Syllable , and that pronunciation be Genuine ; it is no other than our *Why* , as *uios* , *Whios* ; where *i* is the Vowel , and *u* in the nature of a Consonant.

But to return , we need not be tyed to either way of naming the Consonants , whether with the Vowel *before* or *after* ; but in practising to teach , try both ways , especially in sonorous Consonants ,

l. m.

l. m. n. r. s. z. and accept of that, which is hit on first, with whatsoever Vowel, and whether before or after the Consonant, because it equally serves our purpose to express the power of the Consonant. But when you have brought him to pronounce all Syllables forward and backward; you may then at pleasure bring him nearer to the vulgar pronunciation of the *Alphabet*, by writing it again, as you would have him settled in pronouncing it after this manner, *a, be, ce, de, e, ef, ga, he, i, ka, el, em, en, o, pe, qu, ar, es, te, u, va, we, ex, ya, zad*, adding *dha, tha, sha, zha*.

This being premised, let the next Letters he learns, be *s* and *z*. Your Schollar by this time will be pretty perfect at finding out an
Ore-

Ore-vocal to an *Ore-spiritual*, or contrary, in the same posture of Organs, as he shall happen first to hit, and you will have need of something of the same kind of Art, though in another way, to teach him *s* or *z*. Shew a *Gingival* Appulse, and withal by holding your Mouth near to the back of his hand, bare, whilst you pronounce one of these Letters before him, make him perceive that it is a *pervious* Letter, *i. e.* that breath passeth out of your Mouth to your Tongs end, whilst you speak it: and shew him that *T*. is close, but this lets breath pass; and with often trial he will hit on it (though at first it may be *lispingly* or imperfectly;) there being onely *L* or *R* remaining, which are made by that kind of posture
and

and *L* so different, and *R* so difficult, that he will most likely by this kind of exclusion find out *S*, and having gained that, he will soon have *Z*.

Z.

Then shew him the posture of *Sh*. with the Artificial Tong and Palat, and guiding him from *S* to *Sh*, and making him understand by Signs, that they resemble in manner of Sound, and differ in posture, he will perceive and learn it; and consequently *Zh*.

Sh.

Zh.

And if you please now, or after he be more perfect in the rest of the Letters, and entered upon *Syllables*, teach him *J. i. e. dzha*, and *cha. i. e. tsha*. He will soon learn *L*. by being shewed to make a stop with the end of his *Tong*. against his *Goums*, as in *t* or *d*. and let the *Breath* pass by the *Cheeks* or

J.
Ch.
L.

L

sides

sides of the Tong; and if you write down *tl*, and put him to pronounce it, he will perceive it the easier; and he can hardly chuse but make it Vocal, if he pronounce it with a Vowel either before or after. For R, shew him the *Gingival* posture of the Tong, and putting your Mouth close to his Hand or Cheek, while you pronounce it, make him sensible of the *jarre*; which with often trial he will be brought to imitate, though for a while it will be troublesome to him, by reason of its roughness.

When you have thus made him Master of all the *Consonants*, and taught him also to breath out *H*, and with patience, and often repetition (but with all sweetness and pleasantness, and great care that

that you do not tire nor vex him) settled him perfect in the pronunciation of them, and in the knowledge of their Characters; then proceed to the *Vowels*. And first, carefully observe, what Vowels he chanced to joyn with the Consonants in naming them, which might be more than one, as *a*, and *e*, at least. Write that Vowel after the same Consonant, and let him speak it, as he did before; after write the Vowel alone, and shew him the open Figure of the Vowel, and make him pronounce it, which he will readily do, having the sound of it already familiar to him, in naming the Consonants as aforesaid: and thus 'tis likely you will have *a*. and *e*. to teach him, if not more, and bring him into some acquaintance with

L 2

Vow-

- Vowels. Then shew him the posture of *i* by bearing your Artificial Tongue near the Palat, and make him perceive, that the Breath is squeezed out at a *narrow* passage, and he will easily learn it; and when that is done, shew him to add the Motion and Figure of the Lip to it, and that will teach him *u*. For *o*, shew him, as well as you can, the figure of the Mouth, and make him round his Lips and sound in his Throat.
- oo*. And in like manner teach him *æ* by his Mouth and Lips bearing at the corners, representing it by *oo*. And when you come to Syllables, let him understand some words, wherein *u* has the like sound, but without the Lips, as *But, Full, &c.* Lastly, teach him *wa, ya*, describing them both *wa, ya*, and *ooa*,

ia; and *an* (which is the natural
a;) and then he will be sufficient-
 ly, for the present, instructed in
 Vowels. And now he being ac-
 quainted with some Character of
 every sound, you may at plea-
 sure make him understand *Ano-*
malous pronunciations, by shew-
 ing him such other known Letters,
 or Compositions of Letters, which
 have those sounds, as has already
 been done in *che, tshé, j, dake,*
&c.

Whereas the *Vowels* are much
 more difficult to be taught; you
 will find, in this method of falling
 upon them last, great help by the
 Apprehensiveness, he will have al-
 ready gained in learning the *Con-*
sonants, and more forwardness in
 attempting to pronounce; by
 which, when you require one

L 3

Vow-

Vowel of him, he will sometimes stumble upon another, which you are presently to lay hold of, and keep him to shew him the Character of it, and it will be equal gain to you; and still the more he has learnt the remainder will be so much easier, as there remain fewer differences of pronunciation for him to wander in.

Now besides these directions already given, you will find when you come to practise, that your own earnestness and contention to effect what you are about, will continually, whilst you are at work with him, suggest to you several Artifices, whereby to make him better apprehend, what you would have him pronounce, which cannot so well be thought of before hand, nor Rules for it set down

down in writing. Now when the labour and patience of getting the Alphabet is over, the main difficulty is overcome.

Having thus made him learn the *Alphabet* and the Characters of it, next (or together with the other) teach him an Alphabet upon his fingers, or several parts of his hand, by placing the Letters there, which you may devise at pleasure: for example; making the joynts of his fingers of his *left* hand, both on the inside, and also on the outside, to signify some Letter, when any of them is pointed at by the fore-finger of the *right* hand, or by any kind of *Fesche*. Particularly, let the extremity of the Thumb and four fingers of the Left hand, signify *e. i. o. u.* The middle of the insides

L 4

of

of them, beginning at the Thumb, *b, c, d, f, g.* The bending of the Fingers on the inside next the Hand, *h, k, l, m, n.* The backside joynts below the Nails, *p, q, r, s, t.* The middle joynts, *v, w, j, y, z*; any where towards the Wrist, or crossing the two forefingers, *x.* And for those simple Letters, which are used in writing to be expressed by Compositions, as *th, sh, ng, &c.* there is no help for it, but he must be taught accordingly, to comply with that faulty way of writing, which they call *Orthography*, and be directed to describe them so, and write them so too, both that *he* may understand what others write, and *they*, what *he*. You may draw two Portaitures, one of the inside, the other of the backside of the Hand,

and describe the Letters upon the places respectively, this way, or some other, that you shall think better, and make him perfect in this *Finger-language*. And then you will find a great pleasure and ease, by practising with him that way, readily at all times to pronounce what words you describe with your fingers, and often exercise his Pen to write down what you dictate to him; letting him know, when a word is finished, to leave some space between that and the next word. And when you would gratify the Curiosity of others, who shall desire to hear him speak, this way will be most useful and ready. And you may, when you please, have the recreation of surprizing those with admiration, who shall hear the *Deaf* person

person pronounce whatsoever they (though with privacy) shall desire, without your seeming at all to guide him with your Eye or Mouth, otherwise than by beckoning to him to speak, whilst you secretly describe it with your fingers.

The next thing you are to do, is to write down (and it would do well, in a pocket-paper-book, to be ready at hand) all kinds of Syllables, and practise him to pronounce them. First syllables of two Letters, *ba, be, bi, bo, bu, boo; ka, ^sci, ^sti, ^kco, ^kcu; da, de, di, do, du, doo; ad, ed, id, &c.* And then of more Letters, *bla, bra, cla, kna, cra, dla, dna, fla, tra, gla, gna, gra, pla, pra, qna, sca, sha, ska, sla, sma, sna, spa, squo, sta, sua, tla, tra, &c. scra, sdna, sdra, spla, stra, &c.* and all these back-wards

wards, as, *alb, ank, alk, ank, ank, ald,* &c. And when you have made him perfect at Syllables, then you may reckon, that you have taught him all pronunciation of Language, since all words are onely some of these Syllables, or else Syllables compounded of these, as *strand, stra, and*; or else being *poly-syllables*, are but a joyning of more of these Syllables, which is nothing else but pronouncing these Syllables one after another, making a distinction between every word.

Next, you are to teach him the knowledge of *Words*, (but it would do well in the mean time, to make him speak and write some Sentences, to inure him to *Conjunction* of Speech.) And here you may easily shew him Visible Bodies

dies, and Colours, and tell him the names of them, and you may by signes make him understand *local* Adverbs, and some others of Qualities, *well, ill, &c.* as also such *Adjectives*, as represent sensible qualities, as *bitter, sweet, &c.* and many other kinds. Every passage will give some occasion to make him understand more of the Particles and Bands of Speech.

I had once in my thoughts to contrive a Method of *Grammar*, and *Dictionary* for this use. Of *Grammar*, more than I can now comprize in short hints. And the latter, Alphabetically containing the words of the Language, which the Deaf person is to learn; as suppose, *English*. And the Exposition, being a representation of the Figure of so many words, as
can

can be described, and of the rest by such other signes, as might be thought of, referring the *Synonyma's* to those, which have *Expositions*; by which he might help himself to know the *meaning* of such Words as he should meet with, and by often looking on it, gain the knowledge of Words: But the occasion of exciting and exercising my thoughts being unhappily removed, I went no further; but hope to see them perfected by those, who shall meet with such like occasions. And indeed, such a Work, as this, is not to be perfected by study alone; but must and will receive many hints and helps, and to be thought on otherwise, whilst the endeavour is excited, being under experiment and practice. But so far

as I had occasion to study, and practise with happy success, I have faithfully imparted, and wish, it may be useful to those who stand in need of it.

[illegible]

An Experiment concerning Deafness caused by want of due Tension of the Membrane in the Ear call'd the Tympanum; see p. 113.

A Young Gentleman known to divers of the R. Society, was born Deaf, and continued Dumb till his age of 10. or 11 years. His Mother when she was great with him, received a sudden fright; by occasion whereof, the Childs head and face were a little distorted, the whole right side (as I remember) being somewhat elevated, and the left depressed; so that the passage of his left Ear was quite shut up, and that of the right Ear proportionally distended, and too open. This Gentleman being for some time recommended to
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my Care, amongst other things, I spent some thoughts in searching the cause of his Deafness in the Ear, whose passage was open. And having found, that the Auditory Nerve was not perished, but that he could hear the sound of a Lute-string, holding one end thereof in his Teeth; and had some perception of any very vehement sound, I supposed the defect to lie in the want of due Tension of the *Tympanum* of his Ear; whose use I took to be, onely to preserve the Auditory Nerve, and Brain, and inward parts of the Ear from *outward* injury by Cold, Dust, &c. and to be no more to Hearing, than glass in the window is in a Room to Seeing, *i. e.* as the one intromits Light without Cold or offence to those in the room,

room: so the other permits sound to pass, and shuts out what else might offend the Organ ; as appears in the experiment of breaking the *Tympanum* of a Dog, who hears never the worse for some few weeks, till other causes, as Cold, &c. vitiate the Organ.

But for the free passage of the sound into the Ear, it is requisite, that the *Tympanum* be tense and hard stretched ; otherwise the laxness of that Membrane will certainly dead and damp the sound, And because the *Tympanum* is fixed in the circumference thereof to the *Annulus Offens*, and so is not capable of Tension that way, in such manner as a Drum is braced; there remains another way, by drawing it at the Center into a *Conoid* form. And that is the principal

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cipal Office of the three *Officles*, viz. the *Mallens*, *Incus*, and *Stapes*, of which the *Stapes* is fixed to the Inner-bone in the *Foramen Ovale* ; the *Mallens* in the extremity of that Process thereof, which is more direct (though somewhat bowing) lies along fixed to the *Tympanum* ; and on the other end is joynted to the *Incus* by a double or Ginglymoid joynt ; such as in which the upper and lower double Teeth meet one another. The *Incus*, scituate between the two former, is one way joynted to the *Mallens*, by such a joynt as last mentioned ; the other end, being a Process, is fixed with a ligament to the *Stapes*. In the *Os Petrosum* is scituate a Muscle from which a *Tendon* is fixed to the end of another more perpendicular

cular process of the *Malleus*, (some describe two *Tendons* from the same Muscle, one fastened to the aforesaid Process, the other to the neck of the *Malleus*) which drawing the *Malleus* inwards, the joyned ends of that Bone, and the *Incus* receding, make a more acute Angle at that joynt, and give a greater Curvity to the posture of the said three Ossicles; the ligament which fastens the *Incus* to the *Stapes* (which is fixed to an immoveable Bone) complying with the recess of the other end, side-ways at the joynt; and the *Malleus* being fixed to an extensible Membrane, follows the Traction of the Muscle, and is drawn inwards to bring the Terms of that line (which the new posture of the bones

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makes

makes) nearer, in proportion as it is Curved, and so gives a Tension to the *Tympanum*, by drawing after it the Center of the *Tympanum*, and so stretching the surface of it, from a Plain to a Conoid Figure within the same Circumference.

And I conceive, the action of this Muscle does ordinarily and constantly draw the *Tympanum* to a moderate Tension ; but when we have occasion to listen, and give a more particular attention to some sound, the action of that Muscle is then more intense, and the *Tympanum* is drawn to a more then ordinary tension, so to facilitate the passage of the sound.

Now as to the case of the young Gentleman before mentioned, I supposed either the Muscle
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by that convulsive starting Motion in the Womb to be overstrained, and to have lost its Action ; or the *Membrane* by that greater aperture of the Organ to be overstretched , and afterwards to remain so flaccid, that it was beyond the activity of the Muscle and Curvature of the *Officles* to give it a due Tension ; or peradventure there was a concurrence of both Causes. Which due Tension, if by any remedy it might be restored, I assum'd that he might recover his hearing in that Ear : to which end I advis'd that excellent Lady his Mother, to consult with Learned Physitians, if by some adstringement Fumes, or otherwise he might find help.

And for Experiment, I thought of a *Temporary* way , by the impulse

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pulse of any *vehement* sound ; as of a Drum beaten near him : which sound, during its continuance, must needs give the *Tympanum* a Tension , by driving and swelling it inwards, as a fresh gale of wind fills the sails of a ship ; and the Experiment succeeded according to my expectation : for so long as I beat a Drum fast and loud by him, he could *hear* those who stood behind him , calling him gently by his Name (which he understood, having learned to speak and pronounce it among other words ;) and when the Drum ceased , he did not hear the same Persons , when they again very loud called him by his Name. And by this we tryed several times, by beating of the Drum again, and ceasing it ; and he stil heard them, when

when the Drum beat, and heard them not, when it stopt.

Since that time, a Gentleman about *Oxford-shire*, sometimes Student in *Christ-Church*, being in a great degree of Deafness, after I had told him of this experiment, call'd to mind, that he never heard so well and easily, as when he was discoursing with company in a Coach, whilst it went fast, and made a great rumbling noise in *London-streets*: by which he was induced to believe, that the Impediment of his Hearing was of the like nature with the other.

At the same time when this was read before the *R. Society*, a Person of Quality of the Society remembered

membered to have found in himself, (being at sometimes subject to thicknes of Hearing) the like effect with this last mentioned, though he had not before considered the reason of it; his acquaintance having often observed to him, that at such times of his Deafness, he heard them very well, whilst they talked together in a Coach in the paved Streets.

FH

MUSEVM
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FINIS.

BOUND
1989

